

370.19
L945

PN-ABI 466

Isn 72341

To Be Revised

E D U C A T I O N A N D S O C I A L D E V E L O P M E N T

Editors

DON ADAMS

Syracuse University

JOSEPH P. FARRELL

Syracuse University

CONTRIBUTORS

C. ARNOLD ANDERSON

University of Chicago

ALVIN BOSKOFF

Emory University

ROBERT BJORK

George Peabody College for Teachers

HERRINGTON BRYCE

Syracuse University

KURT FINSTERBUSCH

Columbia University

GERALDINE HOLMES

Syracuse University

JOHN KUNKEL

Arizona State University

S. M. MILLER

Syracuse University

KENNETH NEFF

Michigan State University

LEONARD REISSMAN

Tulane University

HELEN SAFA

Syracuse University

DONALD SANDERS

Ohio State University

KALMAN SILVERT

Dartmouth College

RUTH YOUNG

Cornell University

**Report prepared under CONTRACT AID/1a-207 between the United States
of America, Department of State, Agency for International Development
and Syracuse University**

Center for Development Education, Syracuse University

March, 1966

The following is a list of working papers prepared under this contract. Copies of these have been forwarded to the Latin American Bureau, Agency for International Development, Department of State, Washington, D.C.

C. Arnold Anderson and Suellen Fisher	<u>The Curriculum as an Instrument for Inculcating Attitudes and Values</u>
Alvin Boskoff	<u>Social Consequences of Educational Change: the Problem of Translating Theory into Meaningful Measurement</u>
Robert Bjork	<u>Population and Education</u>
Kurt Finsterbuech	<u>Notes on the Methodological Aspects of Large- Scale Cross-National Studies</u>
Geraldine Holmes	<u>Implications of Attitude Change Theory for Formal Education in Developing Nations</u>
John Kunkel	<u>Education and Economic Development</u>
S. M. Miller and Herrington Bryce	<u>Social Mobility, Education and Economic Development in Latin America: a Preliminary Analysis</u>
Leonard Reissman	<u>Urbanization and Education in the Developing Process</u>
Helen Safa	<u>Planned Educational Change and the Process of National Integration</u>
Kalman Silvert	<u>Social Modernization: Outline of a Theory</u>

Education and social development.

370.19 Syracuse Univ., N.Y. Center for Development
S995 Education.
Education and social development. Don Adams
and Joseph P. Farrell, editors. Mar. 1966.
1 v. illus.
Contract no. AID/1a-207.
At head of title: To be revised.

1.Education. 2.Social change. I.Adams, Don,
editor. II.Farrell, Joseph F., editor.
III.Contract no. AID/1a-207. IV.Title.

Foreword

This report by design is broadly exploratory. We have attempted to make both substantive and methodological contributions to the study of education and social development. Some success is claimed in both attempts.

Yet the complexities of the development process, the virtual absence of theory regarding educational change and the low quality of pertinent educational research combine to obstruct precise analysis of the linkages between education and other aspects of development. We do not argue that the past record of education's contribution to development has been made entirely clear by this study, nor have we defined the range of possibilities for future contribution. However, we believe that we have built an outline of a methodology by which this involvement can be more accurately measured.

Many of the contributors to this study are continuing to investigate those facets of educational development which occupy their interest. A revised version of this report will incorporate refinements of their ideas.

Many people deserve thanks for their help in completing this report. The following provided helpful suggestions or criticisms: Mary Jean Bowman, University of Chicago; Robert Cahill, University of Hawaii; Lindsey Churchill, Cornell University; Hector Correa, Wayne State University; Phillip Hauser, University of Chicago; Celia Heller, Hunter College; Burkart Holzner, University of Hawaii; Solon Kimball, Teachers College, Columbia University; Martin Landau, Brooklyn College; Kurt Leuscher, Institut fuer Soziologie, Switzerland; George Meyers, Cornell University; Jerry Miner, Syracuse University; Lee Sechrest, Northwestern University; J. Mayone Stycos, Cornell University; and

Frank Young, Cornell University. The East West Center, University of Hawaii provided invaluable assistance in the form of senior specialist and research assistant awards which made it possible for the editors to perform their work in most pleasant surroundings. Able secretarial and typing assistance was provided by Ada Kageura, Pearl Lilikoi, and Helen Neff.

This study was made possible under a contract with AID. Special appreciation is deserved by those members of the AID staff most closely associated with the study: Vincent Aloia, Michael Chiappetta and Jack Mezirow.

ERRATA

CHAPTER 3

- p. 6, line 7, "...such as the development of national..."
- p. 7, line 7, "...of society. Cultural integration..."
- p. 7, footnote 1, "...Dr. Ernestine Friedl..."
- p. 17, line 7, "the more information it can 'process,' that is, the more information it can"
- p. 36, 3rd line from bottom, "...plans. Development planning should..."

CHAPTER 4

- p. 2, 2nd para., last sentence, "They must also decide whether they..."
- p. 5, 2nd para., 2nd line, "...to follow, and will assuredly"
- p. 24, Table 7 title, line 3, "...SANTIAGO, CHILE..."
- p. 25, 4th line from bottom, "Data were..."
- p. 31, line 13, "Secord, in groups where the small family..."
- p. 33, quotation, line 4, "...people behave in the same way"

CHAPTER 7

- p. 12, line 13, "(for example, the square of a rank order"
- p. 25, 2nd line from bottom, "...to estimate the GNP or the National..."
- p. 33, 2nd para., line 3, "...One purpose of chapters 8 and 9 is to"
- p. 34, line 2, "...Sub-national data have"

Table of Contents

Part I

Introductory

- Ch 1 The Study of Education and Social Development

Part II

Explorations in Education and Social Change

- Ch 2 Education and Social Mobility
Ch 3 Education and National Integration
Ch 4 Population Change and Education
Ch 5 Urbanization and Education
Ch 6 Education and Behavior Change

Part III

Measuring Educational and Social Development

- Ch 7 Utility of Cross National Studies
Ch 8 Measuring Educational Output I
Ch 9 Measuring Educational Output II
Ch 10 Use of Scalogram Analysis in the Study of Development
Ch 11 Conclusions and Implications

CHAPTER 1

THE STUDY OF EDUCATION AND SOCIAL DEVELOPMENT

The problem of those who wish to gain insight into the process of social development is no longer one of lack of literature. The last decade and half have produced an exceedingly large number of studies, reports, and essays on the subject by scholars in the social and behavioral sciences. Some of these studies have been historical in nature while others have been cross-national. Some have been theoretical in their treatment of the subject and others empirical. Yet to a considerable degree the large amount of comment and analysis has only emphasized the complexity of the subject and the urgent need for further careful study. There are several reasons for our inadequate, conflicting and imprecise knowledge of the development process.

Characteristics of Development Studies

1. Studies of development tend to exhibit a parochialism reflecting a single disciplinary approach. Research and inquiry into development have been undertaken by scholars representing many different academic areas in the social and behavioral sciences. Yet these scholars, depending on their disciplinary base, have tended to see social phenomena through different "lenses," their conceptual frameworks, methods of inquiry, terminology, focus of interest resulting from the nature of their academic training. Thus some studies of development in their substance and methodology are mainly economic,¹ treating such problems as formation of capital, investment

¹Walt W. Rostow, The Stages of Economic Growth, Cambridge: Harvard University Press, 1960; Benjamin Higgins, "An Economist's View," in UNESCO, Social Aspects of Economic Development in Latin America II, Paris, 1963; and Harvey Leibenstein, Economic Backwardness and Economic Growth, New York: Wiley, 1963.

policies and the like; others are essentially sociological,¹ examining social change, variations in social structure, and social mobility; while others more psychological² are concerned with analysis of personality, need structures, motives and behavior patterns.

It follows, then, that studies of development are typically fragmented. The economist tends only to be interested in or feel himself capable of studying certain of the events, institutions, processes in a developing society. The same is true of scholars representing other disciplines. The direct implication of this for the planner is seen in the many recent manpower surveys, carried out under U. S. or international auspices, where economists carefully describe how the manpower requirements of economic growth may be translated into educational policy but admittedly are unable to assess the subtle non-economic contributions of education.

2. There is still no widely accepted general theory of development. There are theories of social change and theories of economic growth. But no adequate general models of why and how individuals, institutions and cultures prosper or decline have yet been devised. The confusion over the meaning of development is illustrated by the various uses of the term itself. Throughout the literature one can find that development is used with easy abandon as a synonym for such processes as industrialization, modernization, or even urbanization.

¹Wilbert E. Moore, "A Reconsideration of Theories of Social Change," American Sociological Review, 25 (6), 1960; and Bert F. Hozelitz (ed.), Sociological Aspects of Economic Growth, New York: Free Press, 1960.

²Everett E. Hagen, On the Theory of Social Change: How Economic Growth Begins, Homewood, Ill.: Dorsey Press, 1962; and David McClelland, The Achieving Society, Princeton, N. J.: Van Nostrand, 1961.

3. A certain amount of faddishness has been associated with the study of development. Without doubt the two most vital social issues of contemporary times are world peace and world development. And, since development is such a crucial problem, its study is profitable in terms of research support, consultative opportunities and professional recognition. This is not necessarily the best situation for the nurture of cautious, careful, long-term scholarly inquiry.

4. Given the intricacies of the process of development only gross attempts have been made to show its meaning for the planners of particular sectors, e.g., industry, education, and to establish inter-sector priorities. The emphases to be placed in the developing countries on "heavy" versus "light" industry, infrastructure versus manufacturing, agriculture versus industry are still matters of conjecture. Even after postulating a certain rate of economic growth and establishing production targets as manpower proponents do, a legitimate case has not necessarily been made for investment in "human" rather than other types of resources since the comparative returns on alternative investments resist precise measurement.

These conditions which affect the study of the development also tend to be repeated in the study of the various sectors or components of the process. Studies in development education (if one may so identify that growing professional field concerned with studies of education in developing societies) are relatively new, faddish and often weak in theoretical foundations. These studies frequently are interdisciplinary (or at least persons from different disciplines are expressing themselves on development education), which is to their advantage. They do, however, suffer both from the underdeveloped state of the discipline of education, with its lack of theoretical bases and absence of well developed methodology, and from shortcomings, particularly in terms of measurement, inherent in the social sciences.

Studies in Development Education

The literature on the role of education in the development process, like the literature in the general field of development studies, is sizeable and rapidly growing. This literature could perhaps be divided into "micro" and "macro" educational studies. The former would include analyses of particular curriculum problems, "psychological" characteristics such as motivations or aspirations of a specified student or teacher group, administrative procedures, questions of instructional quality, and the like. While there is a need for more micro educational studies within the development context, these are generally not the concern in this work. The focus here¹ usually is on the level at which basic planning decisions are made.¹

Several categories of macroeducational studies might be identified:

1. There are the general informational studies treating the educational system of a particular country or region. In these studies such topics as administration, elementary education, secondary education, higher education, teacher education typically are included along with some general discussion of "educational problems." Many of the reports and yearbooks of UNESCO and the International Bureau of Education would fall into this category as would several of the publications of United States Office of Education. Journals of professional organizations interested in international education also frequently include articles of a survey nature under such titles as "Education in 'X' Nation" or "Trends in 'Y' Education."

Descriptions of specialized educational programs, presumably of considerable importance to development, such as literacy, adult education, community education, and various programs of an applied or vocational

¹As a partial exception Chapter 6 analyzes individual behavior, but does so always within the social context, seeking implications for national policy.

nature might also be included in this category. Informational reports on such topics may simply relate what has happened in a particular country or may argue that some variety of "practical" education be substituted for or added to current educational programs.

Studies in this first category may espouse a particular view or bias toward the actual or potential role of education in development and may be of a historical or empirical nature. Usually, however, they are non-theoretical in their approach. Since they are broadly descriptive and largely impressionistic they offer little of benefit to the educational policymaker, the educational planner or the scholars seeking to better understand education's contribution to development.

2. Another category could be identified as manpower and educational planning studies. Manpower studies have been in considerable vogue for the past few years and have received great stimulus from such organizations as the Organization for Economic Cooperation and Development, UNESCO and the International Bank for Reconstruction and Development. While theoretically the manpower problem should only be part of the educational planning problem, in practice the two frequently are treated as synonymous. (That is, proper recognition is not given to the contributions of education other than those which facilitate economic growth.) In their most pure sense national manpower analyses and forecasting represent an attempt to determine the number of skilled and professional persons needed to achieve certain levels of production by a target date. School and curriculum enrollments are then manipulated so that the input of students will result in the types and numbers of skilled graduates needed by the economy. Understandably the technical difficulties in forecasting manpower needs and controlling flows

of students may be overwhelming. Data requirements¹ for this approach include: current status and trends in the size and composition of the labor force; predicted structural changes in the economy; current status and trends in educational input and output, especially in vocational, technical and professional programs; and technological forecast data.

While these studies consider education to be of national importance, qualitative differences among educational programs receive little attention. Rather, the concern is almost exclusively quantitative -- providing teachers, students, buildings, etc. in the numbers necessary to fulfill a national plan. Further, the narrowly conceived educational planning approach rests on the assumption that economic development goals are sufficient for determining educational priorities. Not only is this technique incapable of assessing noneconomic societal needs, it fails to deal adequately with the "substitutability" of products of education.²

3. "Cost-benefit" studies of educational programs form a third category. This approach is based on the economic principle of optimizing the return on an investment. Although theoretically these studies attempt to determine both the noneconomic and the economic returns on a particular investment, in practice they focus on the more easily measured economic

¹There is an increasing number of attempts to broaden the educational planning approach beyond consideration of manpower needs. For a summary statement of procedural steps of the educational planning approach, see UNESCO, Economic and Social Aspects of Educational Planning, Paris, 1964, pp. 32-37; for a highly mathematical description, see OECD, Econometric Models of Education, Paris, 1965.

²In addition to the studies carried out by the organizations mentioned above, several universities and individual scholars have contributed to the literature on this topic. Perhaps the individual scholar most associated with manpower studies is Frederick Harbison, whose many contributions include: Education, Manpower and Economic Growth, and High Level Manpower Resources: Country Studies published by McGraw Hill in 1964 and 1965 respectively.

returns. Cost-benefit studies have been attempted -- at least in some partial way -- in several developed and underdeveloped nations. The possible contribution of such efforts to the education policy-maker is obvious. If it becomes possible to measure the rate of economic return from a particular educational investment with satisfactory precision, then policy-makers have a rational basis for making choices between investment in education and some other sector whose rate of economic return is also measurable. One advantage of cost-benefit analysis is that it forces the educator to be concerned with sectors other than his own. That is, the return on a particular educational investment must be shown to be equal or better than the return from investment in other sectors. Since, however, these studies necessarily reflect the peculiar qualitative as well as quantitative arrangements found in the country of the study, cross-national generalization must be made with care.

This approach, while potentially valuable in understanding the contributions of educational institutions to development suffers both from certain methodological difficulties and lack of necessary data. It is one thing to say, for example, that earning power tends to increase with education. It may be quite another thing to be able to measure the costs of schooling (in terms of earnings foregone by the individual as well as buildings and instruction) and relate these to national productivity. Moreover, as some economists have pointed out, market prices are poor indices of productivity for a group (such as doctors) who tend to a monopoly position in the market. Finally, cost-benefit studies, unlike manpower studies which assume growth rates and analyze their implications for manpower requirements at a future time, estimate income data over an earning period but cannot legitimately be said to incorporate a study of linkages between education and development over time.¹

¹Some of the scholars who have made recent contributions to cost-benefit studies include: Theodore W. Schultz who has produced many pertinent

4. Another somewhat disparate group of studies might be formed by inquiries which range in focus from examination of individual personality and motivation to translation of grand social theory (such as that of Talcott Parsons) into developmental terms. Few of these studies have explicitly included education variables. David McClelland¹ in his writings on the achievement motive (an achievement) finds that school curriculum and appropriate teacher-student relationships can reinforce the child's need for achievement; however, these are not a direct concern in his schema. Daniel Lerner² concludes that the key to modernization is the development of the "mobile personality" or "empathy." Empathy, the ability of a person to see himself in another person's social role, is the product of many factors, including literacy.

Concerned with a broad social theory of modernization, Karl Deutsch³ uses the term "social mobilization" to refer to "an overall process of change, which happens to substantial parts of the population in countries which are moving from traditional to modern ways of life." In his extended formulation of the concept and exploration of its measurement Deutsch identifies literacy as one of the constituent processes but offers no explanation as to why education is necessary to his model.

publications including "Investment in Human Capital," The American Economic Review, 51 (1), March, 1961; William G. Bowen, Economic Aspects of Education, Industrial Relations Section, Department of Economics, Princeton University, 1964; Gary S. Becker, "Investment in Human Capital: A Theoretical Analysis," Journal of Political Economy, 70 (5) Part 2, October, 1962; Selma J. Mushkin (ed.) Economics of Higher Education, U.S. Department of Health, Education and Welfare, Office of Education, 1962; and Hector Correa, The Economics of Human Resources, Amsterdam: North Holland Publishing Company, 1963.

¹David McClelland, op. cit.

²Daniel Lerner, The Passing of Traditional Society, New York: Free Press, 1958.

³Karl Deutsch, "Social Mobilization and Political Development," The American Political Science Review, 55 (3), Sept., 1961.

Some attention is currently being focused on a systems analysis approach to the examination of educational policy questions in the developing nations. However, little in the way of a detailed description of the application of this approach to studies of development has thus far found its way into print. Adams and Bjork¹ have made a beginning attempt at the application of a general social systems analysis by relating institutional change in education to Talcott Parsons' theory of social structure. While this effort has been refined in some unpublished work by Bjork, the utility of the Parsonian model for viewing development and the validity of the interpretations of the model with respect to educational change remain in question.

Hector Correa, in an unpublished paper,² examines the concept of balanced growth with respect to the inputs and the outputs of education and the impinging societal forces. William Platt³ has schematically depicted a simple input-output model of education as a contributor to development. Although this model may have limited utility in assisting in the measurement of the contributions of education, it does emphasize rather dramatically the centrality of the productive function of education.

More technically defined, systems analysis uses simulation and model building techniques employed for some years in the physical sciences, but which now because of disciplinary advancements and computer technology have become a valuable tool in the behavioral sciences. While the actual

¹Donald K. Adams and Robert Bjork, "Modernization as Affected by Governmental and International Educational Influences: Japan," Chapter 16 in Stewart T. Fraser (ed.), Governmental Policy and International Education, New York: John Wiley and Sons, 1965.

²Hector Correa, "Balanced Educational Growth," mimeo.

³William J. Platt, Toward Strategies of Education, Stanford Research Institute, Menlo Park, California, 1961, p. 14.

techniques employed are complex, they may result in models usable to test hypotheses about the real world or to test hypotheses about hypothetical situations when real data are unavailable or their access costly.

Several economists have incorporated education into certain specific economic concepts. The works of Theodore W. Schultz, W. Arthur Lewis, Gary Becker, William G. Bowen, Burton A. Weisbiod, Mary Jean Bowman, and Harvey Leibenstein particularly should be mentioned in this regard.¹ Because the emphasis here is skewed somewhat toward the noneconomic factors of development, no attempt will be made to identify further the ideas and theories of these scholars.

There are other studies,² of which this is one, which are concerned with the contribution of a national educational system or a structural level or type (e.g., vocational, general, etc.) of education to the process of development. The concern of these studies is not so much to measure education's economic rate of return or to determine the proper adjustment of schools to manpower needs as it is to learn more about the linkage of education with other societal institutions and processes. Theoretical considerations are, of course, vitally important, but the construction of theoretical models or schema is not the end goal; rather, theory may act as an explicative and as a reservoir of hypotheses.

¹For annotated references to the pertinent publications of these scholars see Joseph P. Farrell, A Bibliography on Education and Social Change in Developing Areas, mimeo., Center for Development Education, Syracuse University, Syracuse, New York, 1964.

²A great number of "macro" and "micro" studies of education indirectly contribute to an understanding of the developmental role of schools. Among these are studies of education and social mobility, analyses of distribution of schooling, identification of educational and occupational aspirations of a population, etc. Indeed, even studies designed to increase our knowledge of education as a social institution or as a socio-psychological process, because of the insights they might offer into the teaching and learning acts, indirectly assist students of development.

This study takes as its basic concern the broad problem of education's contribution to development. Implicit in this concern is the attempt to seek more precise measurement of educational output and subsequently of associations between education and other social variables. However, preliminary to concentration on measurement problems, certain general probes into the linkages between education and certain aspects of social and individual change are attempted in order to further delineate, in keeping with the definition of development to be employed, general ways in which education may be affected by and in turn may support certain crucial aspects of the development process. Such explorations also assist in understanding which educational functions and which social variables warrant attention in terms of more precise measurement and further associational study.

A more specific analysis of the organization of this study is offered later in this chapter. It is appropriate now, however, to describe briefly the meaning of the terms which at the same time limit and focus efforts in this study.

Social Change

Social change may be defined in the most general terms as a complex process-series (or series of phases) in which, however achieved, new roles or new interrelations among roles emerge, with the consequence that significant alterations in the social and cultural products of a society may be identified. Among the major kinds of significant alterations are: the distribution of power and responsibility on public issues; norms of aspiration and achievement; the content of widely accepted or crucial ideological patterns; the level of meaningful frustration; the process of recruitment (replacement or succession) to key roles. All of these types of consequences do not necessarily result from a given process of social change. But this range of consequences is likely if (1) resistances to specific innovations are weak or are successfully removed, and (2) if sufficient time is allowed for the ramification of derivative effects.

The dominant manner in which change proceeds can be shown to vary considerably in history. For much of human social experience, change was relatively gradual, based on chance discoveries of workable solutions to practical problems of survival and organization. In the last few millennia, change by chance accumulation has been supplemented by conscious attempts to alter or "improve" a technique or norm in a restricted area of human experience (e.g., agricultural techniques, military formations or weapons, monotheistic religion). This has been called "change by independent invention" in recognition of the fact that the intention is limited to change in one sphere, without anticipating the adjustments (or maladjustments) that emerge in related activities. Finally, change may be triggered by rational intentions to obtain specific combinations or sequences of change through (1) introducing appropriate innovations at crucial points and (2) anticipating

the derivative consequences of these innovations. Essentially, this mechanism of change is planning, one manifestation of which is development programs.

To make this general definition more explicit, the following dissection of the sequence of phases and typical products may be considered:

<u>Process or phase</u>	<u>Typical product</u>
1. Significant dissatisfaction with some rule, practice, or condition.	1. Motivation to deviate consistently.
2. Deviant technique, practice, or value as "experiment."	2. Innovation or invention.
3. Diffusion or transmission to other persons.	3. Acceptance, rejection, neutral attitudes toward innovation.
4. Competition between partly validated innovation and established practice.	4. Conflict, uncertainty, marginality.
5. General acceptance (or acceptance by strategic minority) of innovation.	5. Institutionalized practice, involving training in the uses of the innovation.
6. Derivative effects of innovations on other related practices.	6. Status uncertainty, mobility opportunities and aspirations, threat to established roles, culture conflicts, lags, "social problems."
7. Attempted adjustment among components of system.	7. Centralization; power extension.
8. Significant dissatisfaction and re-tracing of above phases in sequence --	

It is important to note that the products of social change (summarized in phases 5-7) are not clearly visible in earlier phases, except as potentialities. Consequently, this set of phases must be regarded as a probabilistic series of contingencies. Each phase, it is hypothesized, has a measurable probability of (a) continuing in that state or (b) allowing

the subsequent phases to occur. At any point, the process-series may come to a protracted halt. However, it is assumed that the probabilities of attaining successive phases increase as the process advances to later phases.

Social Development

Because of the confusion in identifying the necessary ingredients in the development process and because of the loose usage of terminology, it is important to define the major technical terms being used and to clarify the concept of social development. Many of the terms used can be best defined within the context in which they will be found in subsequent chapters. However, some general comments regarding the meaning of the terms employed here can be made at this time.

In the literature on development one frequently reads of "economic and social development" or "socio-economic development." Sometimes economic, political and social are treated as the main three separate but reinforcing processes by which a nation develops. Although each of these terms has been used to cover different institutions and institutional functions, the use of the word social has been particularly confusing. Sometimes it has been used as Hans Singer does to refer to levels of living or the "quality of life." Social development, by this definition, involves achieving "better health, better education, better nutrition, better housing, greater social security, etc."¹

In much of the United Nations literature the term social development is used, as by Singer, to have social welfare connotations. The phrase

¹Hans W. Singer, "Social Development: Key Growth Sector," International Development Review, 7 (1) March, 1965, p. 5.

"essential levels of living"¹ is repeatedly employed in United Nations publications, although a wider definition of social development referring to "social structures, value systems and incentives" may also be found.

Raoul Naroll,² in a significant exploratory study, constructed an index of social development; however, he did not precisely define the term. To Naroll social development includes the basic concepts of social evolution and urbanization. He selected two indicators of social evolution (a craft specialization indicator and an organizational ramification indicator) and an indicator of urbanization. These indicators were used in the index. Naroll calculated indices for 30 ethnic groups but did not attempt to apply his method to any large scale, complex societies.

Frequently social is used in contradistinction to economic and social development and has meant development other than economic -- at times including at times excluding, political development. Even within this usage there is obvious difficulty in having a boundary between "economic" and "social." Some definitions of economics³ are broad enough to include a variety of cultural aspects. Certainly in recent years some economists -- although they may have felt "some vague sense of discomfort"⁴ -- have not been reluctant

¹One UN source has identified nine major components of a satisfactory index of levels of living: (1) health, (2) food consumption, (3) education, (4) employment and conditions of work, (5) housing, (6) social security, (7) clothing, (8) recreation, and (9) human freedoms. United Nations Publication E/CN.3/179-E/CN.5/299, New York: 1954.

²Raoul Naroll, "A Preliminary Index of Social Development," American Anthropologist, 58 (4), 1956.

³Note for example the definition of economics found in Lionel Robbins, An Essay on the Nature and Significance of Economic Science, London: Macmillan, 1940, p. 16. "The study of human behavior as a relationship between a multiplicity of ends and scarce means that have alternative uses."

⁴Higgins, op. cit., p. 148.

to consider attitudinal and even ideological factors in making their analyses of the problems of economic development.

Social development will be used in this study to refer to one kind of social change, namely that which is marked by emphasis on planning mechanisms to achieve desired types of complexity (see page 12 above).

Specifically, development involves the following characteristics:

1. specialization of tasks and roles becomes more complex;
2. recruitment to roles is largely achievement-oriented;
3. criteria of evaluating performance are rational (i.e., relatable to specific, demonstrable goals);
4. the interrelation of roles through proper timing and coordination is crucial;
5. conscious, and strategically contributed innovations are required to continue the process of development toward some goal;
6. decision-making is pyramidal (i.e., there are various levels of responsibility, with primary coordinating decisions made at the topmost level);
7. anticipation of normal problems of resistance, coordination, etc.

At any point, the development process may come to a protracted halt. However, it is hypothesized that the "momentum" probabilities of obtaining successive phases increase as the process advances to later phases.

If the term development is used to mean changes in social structure and individual attitudes, values and behavior as well as economic growth, then it may be used (as is frequently done in this study for the sake of brevity) as a substitute for social development.

Within the process of social development the focus here is on education, not only in terms of the implications for education of various social

processes of change but also in terms of the ways education may act to reinforce, slow down or alter the whole process. Since education may be conceived narrowly as formal schooling or most broadly, as behavior change, some explanation of our use of the term is necessary. Generally, throughout the study education is defined in its narrower sense, that is, of "going to school and learning something." Particularly this is true in those chapters concerned with measuring educational output. In the earlier chapters where the concern is with certain major aspects of social change, education at times includes the acquisition of a new knowledge and attitudes in a non-school setting. Whenever a broader meaning is given to the term, however, it will be made clear within the context used.

Focusing on education creates a danger, of course, of over-stating the contributions and therefore the importance of this "favorite" institution. A more subtle danger lies in confusing education as an initiating force for development when it is rather a structural condition which accompanies the process. This report is concerned both with identification of those educational changes which tend to accompany certain major social changes in the development process and, to the extent possible, with measurement of the effect of education on the social processes or institutions in question. Due to the multiple causality and the general interrelatedness of social processes, it is very difficult to determine, for example, whether a particular educational or political policy is requisite to increased productivity in some sector of the economy. A related difficulty is the danger of assuming that the skills and knowledge which form the school curriculum are necessarily acquired through schooling. Being aware of the dangers should help to avoid them but it is doubtful that awareness is always such a guarantee.

The study of development is, by definition, an examination of the processes through which the varying types of underdeveloped or undeveloped societies become consciously transformed into developed ones. Descriptively, therefore, research into development is necessarily comparative in that it arrays the developed against the varieties of underdeveloped. Essentially, it is not the study of social change as such, but of that very specific kind of change which describes the growth of "modern" institutions, social procedures, styles, normative systems, and, possibly, ideologies. While it is difficult to delineate a list of substantive ingredients of development which is non-controversial, any discussion of ideological or political factors is immediately open to criticism.

One of the clear implications of a broad social view of development is that the development process is not unilineal. The impossibility of precise duplication of the steps in modernization is not merely because no two societies are the same, or that no two are ever caught up in the process when the world state of ideology and technology is the same.¹ Those factors, plus historical accidents, leadership-followership relations, and so forth, all inevitably complicate the patterns of such change. Another reason -- and one that permits the consideration of contrast and similarity together, and thus begin to order the cases -- is that there are several types of underdeveloped societies, and that the members of each societal category will respond to the pressures for development in ways very different from other types of societies. The dichotomous splitting of the world into "modern" and "traditional" camps is thus impractically crude, for countries as

¹This does not, of course, alter the fact that some changes usually precede other changes, e.g. a certain development of infrastructure is required to support a developed economy.

different as Portugal, India, and Tanzania will thus find themselves in the same category, and will still have to make room for Saudi tribesmen, Berbers, and Central American Maya villagers. No empirical evidence suggests that more complex orders of human organization must evolve out of less complex ones through the historical "stages" of human community sometimes described by anthropologists and historians. Nomadic tribes do not become semi-nomads, evolve settled and isolated village cultures, blend into over-arching feudal patterns, develop into mercantilistic town cultures, and then have their French Revolution before they become modern.

What is suggested in the above paragraph is a way to begin ordering types of communities so that interactions among them can be measured. Thus the study of development is transformed not into a gross analysis of how traditional persons become integrated into contemporary industrial society, but rather an exploration of the varying ways in which tribesmen may be affected, for example, or the patterns of accommodation to various facets of modern organization which a Hispanic traditional society may evolve. In addition the researcher becomes sensitized to the differences between the acculturation of an isolated village to a Mediterranean traditional culture, and its acculturation to a modern industrial urban center.

This study is not the place for an elaboration of this "theory" and discussion of the criteria by which societies could be so ordered. A brief explanation has been offered merely to clarify the concept of social development, to justify the emphasis on comparative analysis and to emphasize the tentativeness of generalizations which may be made. A "picture" of a developed society should be of further help in examining the ramifications of the meaning of development used here.

Identifying Features of the Developed Society: An Ideal-Typical Approach

A developed society¹ is a form of human community characterized by an industrial life style, a complex and interlaced occupational and social structure, and the routinized public procedures of a universally participant polity which permit the forms of social organization to change qualitatively without institutional discontinuity. This definition is "ideal" in the sense that no real case will conform exactly to its standards. It also is intended to indicate how economic, cultural, and political factors may be synthesized, and to imply an operational test -- the ability to change social forms and procedures without breakdown.

To begin the elaboration of this definition an analytical examination of its elements may be made. "Industrial life style" does not necessarily mean that a national economy must boast of the physical presence of an industrial plant (as Denmark does not), but rather it must be characterized by a particular set of relations between the economy and the individual (both as producer and consumer). Labor relations must be contractual and impersonal, the occupational structure highly articulated, and access to consumers' goods so widespread as to permit all sectors of the population to share in the fruits of the "industrial infrastructure" -- power, communications, transportation, and the like. At the root of the smooth functioning of these economic relations is the existence of a "marketplace": a set of functional relations in which all attributes of the actors are held in abeyance except for their possession of the recognized currency,

¹Since a developed society is still a developing society this is a definition as of now. Tomorrow a new definition may be demanded. It should also be emphasized that this definition prescribes the what but not the how (method) of development.

and where they may exchange and influence the distribution of goods and services without reference to any factor except their possession of that currency.

Because a rationalized and industrialized economic structure seeks to maximize productivity, the "currency" of the actors in such a marketplace is a function of individual ability and not of such ascriptive "accidents" as family or race. The role of education in the development process is often introduced at this point as a means of raising individual competence to increase productivity. The way in which such individuals are laced into economic structure, however, is the result of merit measures impersonally administered or, conversely, of such ascriptive criteria as family, friends, influence, appearance, race, and so on. The effects of formal education, at least at the lower levels of schooling, on the economic institution can be meaningfully discussed only in terms of the forms and social meanings of the patterns of access afforded the individual.

The most crucial feature of the social structure of a developed society is the kind of relationships existing among the several social layers. The class position of an individual is determined by assessing the composite of economic power (e.g., income, occupation, ability to command the labor of others, ability to command goods on the market), "social" power (e.g., status, style leadership, deference patterns), and political power (ranging from overt leadership to tacit acceptance). In developed societies individuals can project themselves psychologically across class lines,¹ they are afforded standardized and recognized mobility channels, and the mobility may occur through any of the economic or noneconomic routes even though subjective

¹See the notion of empathy in Daniel Lerner's The Passing of Traditional Society, op. cit.

criteria of status are always the slowest to change. No single group maintains a monopoly on the various aspects of power and, as in the case of the economic sphere, merit is recognized as the primary measure for mobility. Again, as in the case of the economic structure, the society provides the institutions to permit the individual to realize his potentialities and reveals to him the mechanisms through which he can make his continuing adjustments.

The nation-state is the institutional vessel through which the modern polity expresses itself.¹ The nation-state describes the boundaries of community, it orders conflict among individuals and social orders by reserving to itself the ultimate settlement of dispute. In the accomplishment of these functions the nation-state depends upon legitimacy deriving from a national consensus that law should be treated as absolute within the larger acceptance of its transitory and thus relative nature, and that equality before the law is to be defined first as an attribute of citizenship, and second as an attribute of membership in given, "reasonably" determined categories. The "political marketplace," so to speak, is thus a function controlled by the currency of opinion about the uses and distribution of power, and the standard that supports that currency is citizenship in the nation and loyalty to (or confidence in) that nation.

With respect to economic affairs, the developed polity formalizes the relationships among the actors involved and, where appropriate, the organizations through which they operate. In addition, through its assumption of primary responsibility for training and education, it provides

¹This statement does not imply that international participation is not a requirement of development. Political and cultural, as well as economic, considerations demand such participation.

the basic conditions necessary for creating and varying competences demanded by a highly articulated economy, and establishes the merit basis for personnel selection.

With respect to social structure the developed polity does not erase conflict between interest groups, but rather forces it into supra-class and supra-interest channels for the ultimate resolution of conflict. The modern nation-state thus systematizes the high degree of differentiation and variation prompted by and necessary to highly specialized (and thus potentially highly productive) modern organization.

Political development is an important component of social development -- even considered by some social scientists to be a prerequisite to economic growth and planned social change. James Coleman gives the following definition of political development.

. . . the acquisition by a political system of a consciously sought, and qualitatively new and enhanced, political capacity as manifested in the successful institutionalization of (1) new patterns of integration regulating and containing the tensions and conflicts produced by increased differentiation, and (2) new patterns of participation and resource distribution adequately responsive to the demands generated by the imperatives of equality.¹

The emphasis on "new patterns of integration" and "new patterns of participation" is perhaps quite standard in the definitions of most political scientists. Coleman, himself, in describing the "modern participatory state" identifies two possible models -- the totalitarian and the democratic. His preference for the latter is obvious and he finds the democratic model more viable for the modern world; that is, he believes that a democratic polity is a better vehicle for bringing about and sustaining development.

¹James Coleman (ed.), Education and Political Development, Princeton, N.J.: Princeton University Press, 1965, p. 15.

Ward and Rustow are more cautious; whereas they emphasize that developed polities are characterized by widespread interest and involvement they do not argue that political development necessarily implies democratic decision-making. Indeed, in commenting on the communist belief that all societies move along a single path toward one preordained goal, these authors conclude that "this artless and simplistic notion does not gain in validity as we change the sign at the finish line from 'Communism' to 'Democracy.'"¹

Value and ideological systems support these economic, political and other social orders. Although developed societies can incorporate a variety of value systems, these normative constructions tend to be relativistic, secularist in respect to public affairs, and pragmatic. Thus they maintain the workings of the institutions described above. Perhaps more significantly, they operate at the level of individual belief in such a way as to cause the participant member of the modern nation to adjust himself by anticipation to changes elsewhere in the society. In addition, the value structures which legitimize the activities within the developed society also reinforce that initial cession (or creation) of public power by increasing the rate of anticipatory obedience to law and decreasing the necessity for the employment of overt enforcement. This syndrome makes predictable and effective the interplay between short-term legal absoluteness and long-term social relativism and pragmatism; in short, it makes possible the interplay between continuity and change.

¹Robert E. Ward and D. A. Rustow (eds.), Political Modernization in Japan and Turkey, Princeton, N.J.: Princeton University Press, 1964, p. 5.

The Asymmetry of Development

To say that "real-type" human situations can never conform to "ideal-type" definitions is but to say that all human organization is asymmetrical when contrasted with rationally self-consistent theoretical models. The structuring of this fact of asymmetry (or asynchronorous development, as the phenomenon is sometimes called) is of crucial importance in discussing the nature and patterning of change, as well as the playing out of social structural differences and their effect on patterns of conflict and conciliation.

Asymmetry in developed, as contrasted with underdeveloped, societies has differing effects on the social process for two primary reasons: (1) in developing societies the spread of types of human communities, value systems, ideologies, and behavior traits is invariably wider than in developed countries; and (2) the lack of definition or objective weakness of super-ordinate groups in pre-national situations is such as to lessen possibilities for the imposition of common behavior patterns on individuals despite value and other differences. A few of the categories of asymmetry, in exemplification of the first point, can be suggested as follows:

a. The coexistence of differing kinds of human communities, as already mentioned. (Brazil is one of the more obvious cases.)

b. The coexistence of class and caste systems (especially where there is ethnic differentiation, as in Latin America's Indian countries).

c. The coexistence of antagonistic "world views," as in the nationalistic and relativistic stance of the "modern" man as opposed to the hierarchical and organically unitary view of Mediterranean "feudal" traditions, or the face-to-face familistic orientation of the villager, and so forth.

d. The coexistence of mutually opposed ideologies; to build on previous examples, the "modern" man may espouse secularistic and relativistic schools of thought ranging from classical Liberalism to the standard European parties of the left. On the other hand, the "traditional" tends toward equally classical Mediterranean "Conservatism" (all is as it is because matters morally must and should be as they are) or toward hierarchical corporatist forms; and village-bound pre-literates unaffected by outside ideological influences tend toward non-intellectual and usually short-term divisions associated with personality difference, family and inter-familial conflict, and the like.

e. Class structure in situations of high physical and occupational mobility also reveals unevenness: heightened economic power (in terms of income and job prestige) commonly is not easily matched in terms of correlative increases in social status and political power. Often the road to economic advance is political mobility, while high social status tends to impede drastic drops in economic and political power.

f. Confusion between expected behavior and implicit value and explicit ideological commitments also occurs commonly. For example, persons of traditional values may occupy professions in which impersonal and semi-scientific behavior is expected, and where most co-workers evince ideologies of a generally modern cast. Conversely, persons of "modern" persuasion may be expected to meet the traditional standards of behavior associated with political personalism, extended kinship systems, rigidly hierarchical and particularistic administrative and social organization, and so forth.

This diversity of structures, functions, and values thus affects not only the pseudo-"national" society of underdeveloped countries, but also

operates within ostensibly homogeneous sub-national cultural groupings to influence the meaning of class and other associations. In addition, of course, this diversity affects the individual himself by setting up contradictory patterns between his belief systems and his behavior within his several reference groups. The obvious social result is to impede consensus and the consequent legitimation of a single, coherent series of institutions, and thus to inhibit the generation of the public power which otherwise might permit the employment of massive force to impose a certain minimum compliance with modernizing behavioral norms, despite opposing belief systems. That is, the result of these asymmetries is the second point mentioned above, the objective weakness of superordinate groups. Even though these groups may have a very high level of relative strength, especially because of an absence of adequate checks on their area of decision-making, they necessarily lack the objective power required to break through the resistances posed by the absence of a single, national consensual group.

An example may make this point clearer. In Brazil average per capita income figures mean little for predictive purposes because the significance of money varies from community to community -- from the aborigines of the Amazon valley to the isolated villagers of the Valley and the Northeast to the nomadic Guarani of the Chaco to the peons on the haciendas of the Northeast to the residents of the mercantilistic service towns scattered throughout the country and of the massive industrial urbanization of the Southeast. For the same reason, austerity programs for inflation control work badly because the government lacks the consensus required to impose taxes which would supply the physical strength required to force compliance with generally unpopular legislation. This approach also explains why the less socially developed Latin American countries have the hardest currencies and are able

to impose the strictest monetary controls: the small, visible upper group shares a monopoly of social, political, and economic power, and is so visible as to find it difficult to evade the laws of its own making. In addition, this sector controls the export economy. So, the superordinate group in such countries as Honduras and Nicaragua are a primitive simulacrum of national community, while much more complex and developed Brazil contains groups with many differing degrees of participation and power which permits much greater effective resistance to law.

Focus of the Study

This chapter has attempted to describe -- without building a definitive theoretical model -- social development and to clarify the meaning of terms associated with the study of development.

Section II explores the interaction of education with certain social and individual changes which are a vital part of the development process. More specifically this section is concerned with the linkages between education and national integration, population change and urbanization. Although the factor of social mobility cuts across several of the other topics treated it is important enough to warrant separate attention. Similarly, the problem of building behavioral patterns supportive of development receives special treatment. The topics in Section II thus are "big" topics and their analysis here is obviously not meant to be exhaustive.

Section III attempts to get to the heart of the problem of measuring educational and social development. First a critique is offered of some of the major cross national studies which use quantifiable indicators of development. Secondly, two refined measures of educational output -- both

still undergoing modification -- are described and evaluated. Finally, exploratory use is made of scaling techniques in the study of the structural dimension of educational development.

Yet refined measures of educational output are but a starting point, for better measures of other significant social variables are also needed. Given improved measures with which to work the crucial next step is that of devising appropriate research and analytic techniques to more precisely link educational changes to other social changes. The final chapter summarizes the progress made in this study toward a solution of these problems and suggests a direction for additional research.

While one of the purposes of this study is to provide insights of value to educational planners and policy-makers, little attention is given to the mechanisms of educational planning as such. For example, no attempt is made to identify or analyze the problems of integrating educational plans with national development plans. Nor is space devoted to the critical technical, intra-planning problems related to making demographic projections, analyzing manpower requirements, assessing rates of educational wastage and dropout, figuring cost estimates and so on.¹ It is not that these are regarded as unimportant problems; they obviously are important. However, the concerns of this study are more fundamental, namely: to add substantive insights regarding the participation of formal education in the development process and to improve upon current methods of measuring this participation.

¹For introduction to the problems and techniques of educational planning see UNESCO Economic and Social Aspects of Educational Planning, op. cit., and Don Adams (ed.), Educational Planning, Syracuse University, 1964.

Part II

EXPLORATIONS IN EDUCATION AND SOCIAL CHANGE

CHAPTER 2

EDUCATION AND SOCIAL MOBILITY

In this chapter particular attention will be given to the meaning of social mobility, its role in social development, its dependence upon education, and its promotion.¹ Development, social mobility and education have been given considerable attention in current analysis, for they supposedly are among the most urgent goals of all nations. Unfortunately such core concepts tend to have a sponge effect, absorbing a number of ideas which are not always relevant. On the other hand, for many purposes it is not necessary to pin-point technical definitions because these concepts are multi-dimensional in content and implication; they, therefore, may be useful even though they are imperfectly specified and the basic processes involved are only broadly sketched.

Accordingly, this chapter begins with some general statements concerning social mobility and education and then proceeds to suggest that the nature and level of interrelationship among these variables are not constant. This conclusion confounds policies whose prime purpose subsumes multiple objectives and which assume that change of any variable produces near-equivalent change in the others. Moving from prose to "hard" data, an analysis of various dimensions of social mobility in two centers of an

¹Problems in the interpretation of the concept of mobility as a theoretical construct are discussed in Melvin M. Tumin and Arnold S. Feldman, "Theory and Measurement of Occupational Mobility," American Sociological Review, 22 (June, 1957), pp. 281-288; S. M. Miller, "The Concept of Mobility," Social Problems, 3 (October, 1955), pp. 65-73; Charles F. Westcoff, Marvin Bressler and Philip C. Sagi, "The Concept of Social Mobility: An Empirical Inquiry," American Sociological Review, 25 (June, 1960), pp. 375-385.

31'

underdeveloped country will be presented.¹ A central feature of this analysis is its demonstration of the relationship between occupational status and education. The final portion of the chapter emphasizes suggestions for policy makers

The Processes of Social Mobility and Education

Social mobility. Mobility is a more multi-faceted concept than its methodological treatment by sociologists would indicate. First, geographic and social mobility cannot easily be separated. All of those who leave the land and move into the city may not realize great increases in their income. Nor do they necessarily change their occupational status to a great degree. Further, they may even become unemployed, without the benefit of finding refuge by returning to the farm; but their situation may change in other ways, as in greater access to education and to the amenities of urban life.

Second, the broad (and frequently political) concern in social mobility is often not with occupational change, but with mobility as it affects other aspects of life. The focus may be on the development of citizenship rights and the emergence of new groups in the political structure. Groups which are legally not allowed to work, to vote, or are not able to vote because of certain circumstances, or lack of interest in voting, may become active and forceful political influences. These are changes in social mobility, even though they are not reflected in figures on occupational movement.

Third, contemporary sociological studies of social mobility measure occupational movement in various ways, focusing on the prestige of occupations. Is a movement into a profession of higher prestige, but of less

¹Data are largely taken from two South American cities for purposes of illustration and analysis.

economic security, or lower income, a gain for an individual who moved from an occupation which stands lower on prestige but higher in other respects? Occupational prestige, the most commonly used indicator, does not capture all that is vital about occupational change. Since, however, it is a relatively amenable, broad-ranging indicator, occupational prestige is widely used.

At least three different time aspects are involved in mobility studies. The first is intergenerational mobility in which the occupations of fathers and sons are compared. Has the son advanced in occupational level, as compared to the occupational level of his father?

A second focus in the study of mobility is intragenerational mobility, the occupational movement of an individual throughout his career. In this case the concern is whether an individual who starts in the occupational structure at one level has the opportunity to move to higher levels within the occupational structure. The individual is the unit and he is compared with himself at different points in his career.

A third approach is that of stratum mobility, in which the concern is not the fate of the individuals, but the fate of occupational and social groups. Has the relative position of the group improved? For example, are farm workers now doing better economically, politically, and socially relative to urban workers? Have skilled workers as a group improved their relative standing in society? These questions are phrased to elicit information on changes in the position of a group or stratum rather than with the possibilities of upward or downward mobility of a given individual within them.

Social mobility may be a result of economic growth and may contribute to it by providing the personnel needed for particular occupations. The

33

prospect of high rates of mobility may provide incentive for hard work, investment and risk. But social mobility may be a goal of development in its own right. The objective may be a society of greater equality of opportunity than exists in traditional societies and the assessment of "progress" may include an evaluation of the occupational possibilities of individuals born in different strata of the society. The attainment of high rates of social mobility for those born in families of low economic or occupational standing may be an important result of social justice, an important goal for many nations in their development programs. Thus social mobility may not be desired chiefly for its instrumental contribution to development but as an independent goal.

Education. Three dimensions of education will be considered -- the level, the kind and the distribution. Some societies, as they attempt to industrialize, emphasize expanding university education. Other societies make a different choice and expand primary education. Which level is chosen is extraordinarily important for each level offers the economy a different quality of worker. Further, each offers the society a different level of awareness and each creates a different set of consumer needs. At what point in its development is it desirable for a society to emphasize primary education rather than secondary or university education? This is a problem that a society has to face if it wishes to have a rational educational policy instead of pursuing fads. These problems are not slight in underdeveloped countries where resources for investment in education are very scarce, but where such investments must be urgently undertaken.

The kind of education is also very significant. Here frequently the choice is between stressing liberal (or general) or technical education.

Technical education often has been emphasized in current debate. But this may be a temporary phenomenon as the non-economic functions of education receive greater attention.

The distribution of education has independent importance since education is a basis of social stratification. Who gets what and how much are political and social as well as economic questions. Does the lower social stratum have an opportunity to obtain secondary education, or does the expansion at this level primarily benefit the already better-off? The distribution of education shapes the society.

Other questions also need to be answered. For example, should educational opportunities be expanded in the cities or in the rural areas? Should there be an attempt to have a general advance throughout the society, or should education be localized in particular regions? These are all issues of great importance in educational planning and cannot be answered solely in terms of economic criteria. Decisions about these questions cannot be considered apart from others which plague societies as they strive to develop. No policy is universally useful. For these reasons, it is important for developing societies to ask where they are, where they wish to go, and what they are willing to sacrifice.

The Role of Social Mobility in Development

Social mobility is said to be related to economic development in at least two ways. Schumpeter,¹ Hagen² and other social scientists have held

¹Joseph Schumpeter, Theory of Economic Development, Cambridge: Harvard University Press, 1961.

²Everett E. Hagen, "An Analytical Model of the Transition of Economic Growth," M.I.T., CIS (Document C/57-12). Kingsley Davis has placed strong stress on the central role of social mobility in economic development. See his "The Role of Class Mobility in Economic Development," Population Studies, 6, July 1962.

35'

that upward mobility into elite classes is necessary for economic development. While this position is increasingly accepted, it overlooks the importance of downward mobility into middle and manual classes. Data from economically developed countries reveal that high rates of downward mobility occur in advanced societies.¹ Moreover, as will be seen in this chapter, it is quite possible that low-income countries do have mobility patterns which conform to those which have been discovered in high-income nations.

This observation suggests that it is time for a transition in thinking about the relationship between social mobility and development. It is necessary to move from a general concept of social mobility to specific patterns and directions of movements; and, ultimately, an attempt must be made to determine which optimal rates and patterns of social mobility are most conducive to what form of development.

Social mobility may promote economic development indirectly through its impact on the operation of other subsystems of a society, in particular the political system.² These other subsystems may influence the development of the nation as a whole. Thus, through upward mobility, talent for political leadership is obtained from the lower classes, greater political commitment and participation may be forthcoming from poor but aspiring groups, rights of citizenship may become more diffused in the society, making new coalitions possible, and so on.

¹S. M. Miller, "Comparative Social Mobility: A Trend Report and Bibliography," Current Sociology, 9 (1960), p. 34.

²Some broad ideas of the relationship between social mobility and political development is given in Gustavo Lagos, International Stratification and Underdeveloped Countries, Chapel Hill: University of North Carolina, 1963; and in Myron Weiner, The Politics of Scarcity, Chicago: The University of Chicago Press, 1962.

Opportunities for upward mobility may also be important in the fostering of an "attitude toward development." The simple suggestion is that people would be willing to work hard if: (1) there were a chance to improve their status and (2) if those of high status risked loss when they failed to work hard.

Social mobility can also be a negative factor in development. High rates of social mobility can lead to the heterogeneity of social classes; that is, a social class might be created of individuals whose social origins were quite varied. The result could be a lack of "consciousness of kind" which might jeopardize commitment to the role of the class in the development of the nation.¹

Further, social mobility can produce frustrated individuals. Thus, citizens may obtain the right to vote but be deliberately prevented from exercising that right; or they may be permitted to exercise the franchise only to discover that their votes may be uncounted, under-counted, or miscounted. Similarly, individuals may undergo the expense and unpleasantness of preparing for an occupation from which they are then barred on the basis of their social origin.

These points all lead back to the basic theme: It is time for a transition in thinking from considerations of social mobility in general to specific patterns and ultimately to optimal rates.

Social mobility, then, is no panacea for development, or for political and social stability. Nevertheless, it is a much treasured value in itself.

¹Some evidence in support of this contention may be obtained from findings that the less social mobility a worker has experienced, the more likely he is to participate actively in his trade union. See Arnold Tannenbaum and Robert Kahn, Participation in Union Locals, Evanston, Ill: Row, Peterson, 1958, pp. 142-148.

The concern for social justice and equality of opportunity as well as the desire for higher per capita income underly the pressure for development.

Patterns of Social Mobility in Brazil

Mobility data are available for only some of the South American nations, and in these cases the information relates to a particular city, rather than to the entire nation. The fragmentary data available permit only a limited range of analysis, not a basis for a definitive assessment of mobility and educational patterns. The data used here concern intergenerational occupational mobility in Buenos Aires, Argentina, and Rio de Janeiro and Sao Paulo in Brazil.

The three dimensions of mobility -- economic, social, and political -- do not necessarily advance jointly. A group may advance in terms of income without advancing in relative prestige standing or without reducing the social distance between it and other social groups. A social and economic advance may not be accompanied by the expansion of citizenship rights and political participation. Indeed, it is frequently found that the most revolutionary group in a society is one which has advanced economically or socially but has not had an equal advance politically in terms of citizenship rights or group acceptability. Therefore, as stated earlier, it is necessary to identify the nature of the social mobility to be investigated, since many different (and disconnected) aspects of mobility occur in the process of development. A nation may choose to emphasize one aspect over another.

In order to use available data, heroic assumptions must be made. For example, nonmanual employment is treated as superior in skill, income and prestige to manual employment. But this is frequently untrue. Further

assumptions are that individuals accurately report their own and their fathers' occupation and education and that societies are "closed" so that there is no migration or immigration. Conclusions from these data then must be treated as very tentative and suggestive, but they may nevertheless be instructive.

As will be seen, important variations exist among these cities. Conditions in the countryside probably contrast even more sharply. The "national pattern" of mobility is made up of these sub-patterns, but conditions vary among urban and rural areas and among and within cities. It might therefore be misleading to think in terms of a national aggregate pattern even if mobility data were available for the nation as a whole.

The occupational distribution. Perhaps the single most informative indicator of the contours of a society is its occupational distribution, showing the percentage of the population involved in various occupations. The occupational distribution reveals what kind of economic activities are important, how people spend their work time, what some of the significant changes in society are, and what prominent social and economic groups are present in the society.

As development takes place, a shift toward skilled occupations is expected. For the most part this shift is revealed in the data of Table 1. In this table the occupational distributions of Rio de Janeiro and Sao Paulo at different times are presented, using the data for fathers' and sons' occupations. While these figures differ from the actual distributions of an earlier period, they can be taken as a reasonable estimate of the occupational distribution of 30 years ago.

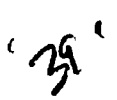


TABLE 1

DISTRIBUTION OF THE LABOR FORCE

IN FATHERS' AND SONS' GENERATIONS

(In percentages)

Occupations (1)	Rio de Janeiro, 1958-1962		Sao Paulo, 1960	
	Fathers (2)	Sons (3)	Fathers (4)	Sons (5)
I. Professional and administrative	3.8	4.6	5.9	6.8
II. Managerial and executive	2.5	4.2	5.7	10.2
III. Upper-grade white collar	6.5	13.8	12.8	17.8
IV. Lower-grade white collar	16.6	15.0	20.5	17.7
V. Skilled manual and routine non-manual	25.7	31.7	23.1	33.4
VI. Semi-skilled and unskilled manual	44.9	30.6	32.0	14.0
TOTALS	100.0	99.9	100.0	99.9

Note: Details may not add up to 100 percent because of rounding errors.

Source: Data made available by Bertram Hutcherson, Centro Latino-Americano de Pesquisas em Ciencias Sociais, Rio de Janeiro.

The differences in occupational distribution between the two generations are both the results and the causes of social mobility. In succeeding tables an attempt will be made to uncover the complicated role of social mobility in the changing occupational distribution.

The most striking finding in Table 1 is the decline of the percentage of the labor force in the bottom-most category, the semi-skilled and unskilled manual stratum. In the fathers' generation in Rio, this group constituted well over four-tenths (44.9 percent) of the labor force, dropping to three-tenths (30.6 percent) in the sons' generation. In Sao Paulo, the drop was even more dramatic, from almost a third (32.0 percent) to less than a seventh (14.0 percent).

The shift to a greater preponderance of the labor force in the upper occupational groups is very noticeable. In both cities the relative size of the managerial and executive category was doubled. The upper-grade white-collar group also showed a decisive percentage increase; in Rio, this category doubled in relative importance. The skilled manual and routine non-manual also made sharp gains, though not as much as other expanding categories.

The lower-grade white-collar group is the only group, other than the semi-skilled and unskilled manual, to show a relative decline. The decline of the lower-grade white-collar group is indeed surprising since this is one of the groups expected to expand as economic growth occurs. If the upper- and lower-grade white-collar categories are combined -- to remove the possible effects of shifting definitions of the boundaries between the two -- an increase is evident which is greater in Rio de Janeiro than in Sao Paulo. In Rio, the combined white-collar group increased from 22.1 percent to 28.8 percent and in Sao Paulo the increase was from 33.3 percent to 35.5 percent. The slight Sao Paulo increase may be due to the already

41'

high proportion of white-collar workers in the labor force during the fathers' generation. In both societies, the change in the relative size of the combined white-collar group is in the expected direction -- upwards.¹

The general picture in both cities is a shift from less to more skilled occupations in the labor force. The next concern is the extent to which the increased number of higher-level positions were filled by the offspring of those already at the higher levels of the occupational structure and the extent to which these positions were filled by those born in less advantaged families.

Mobility from stratum of origin. Table 2 reveals the percentage of sons who are in occupational levels different from those of their fathers. This movement out of the stratum of origin is termed "outflow." It is generally said that political and economic development requires a high degree of fluidity, of the movement of individuals born in one social category to others. The data here confirm this contention.

The overall impression is of high outflow from all of the occupational strata. Of the 12 cells for the two cities, only four were below 50 percent and the percentages here were above 43 percent. These outflow figures are very high. Moreover, this high outflow is observed even for categories which were identified as growing rapidly in the sons' generation.

But the two cities differ in their pattern of outflow. In Rio de Janeiro, 44.7 percent of the sons born of fathers in semi-skilled and unskilled occupations left those strata. This was the lowest outflow from any strata in that city. In Sao Paulo 65.7 percent moved out of the

¹Further information on occupational mobility in Brazil may be obtained from Bertram Hutchinson, "Urban Social Mobility Rates in Brazil Related to Migration and Changing Occupational Structure," America Latina, VI, No. 3 (Julho-Setembre de 1963), pp. 47-62.

TABLE 2
TOTAL OUTFLOW FROM VARIOUS STRATA
(In percentages)

Occupations	Rio de Janeiro	Sao Paulo
I. Professional and Administrative	53.6	43.1
II. Managerial and Executive	62.0	58.3
III. Upper-grade white collar	47.6	50.4
IV. Lower-grade white collar	64.9	65.9
V. Skilled manual and routine non-manual	48.2	53.2
VI. Semi-skilled and unskilled manual	44.7	65.7

Source: See Table 1.

semi-skilled and unskilled group. Professional and administrative mobility was, on the other hand, higher in Rio than in Sao Paulo. The differences for other categories were not great.

The data presented in Table 2 also answer the question: In which categories do sons have highest inheritance of fathers' occupations? The lower a percentage in Table 2 the higher the inheritance. From this perspective a semi-skilled and unskilled son was much better off in terms of opportunities if he were born in Sao Paulo rather than in Rio de Janeiro; for his chances of remaining in that category would have been less. Regional variations of this kind are important in affecting the rates and patterns of mobility.

Sons of professional and administrative workers were more secure in Sao Paulo than in Rio, since 56.9 percent maintained their fathers' occupations in Sao Paulo and 46.3 percent in Rio de Janeiro.¹ The chances of not falling out of the elite and of rising from the bottom of the occupational ladder were distinctly better in Sao Paulo than in Rio.

The destinations of the mobile. As yet only the percentage of a particular stratum who were mobile has been discussed. Of great importance is where did the mobile go -- did they find occupations different from or close to those of their fathers?

Table 3 shows a high concentration of the mobile in categories contiguous to that of their social origins. Most persons moved up or down one level in both Rio de Janeiro and Sao Paulo. In Rio de Janeiro, 91 percent of all who left the managerial and executive category either fell one step to upper-grade white-collar work (66 percent of them did this) or rose one step to the professional and administrative stratum (25 percent). Very few (4.5 percent) fell into the skilled manual and routine nonmanual category, and none into the lowest stratum of semi-skilled and unskilled manual. At the other end of the social ladder, the short-range pattern of mobility was also manifested. In Sao Paulo, 64 percent of those who left the semi-skilled and unskilled stratum moved one step upwards to the skilled and routine non-manual category. In general, those who are mobile do not undergo big changes in social position. This has also been the experience in highly industrialized societies.²

¹The bottom and top-most categories are the most important to look at in this perspective for the in-between categories could have either up or down mobility so that the data of this table are inconclusive in terms of relative advantage.

²Cf. S. M. Miller, Comparative Social Mobility, op. cit., p. 41.

-44-

TABLE 3
THE DESTINATION OF MOBILE SONS IN RIO DE JANEIRO AND IN SAO PAULO*
(In percentages)

Occupational Origin	Destinations						Total
	(1)	(2)	(3)	(4)	(5)	(6)	
I. Professional and administrative	-	32.2	55.9	5.1	5.1	1.7	100
		48.0	40.0	12.0	0.0	0.0	100
II. Managerial and executive	25.0	-	65.9	4.5	4.5	0.0	100
	40.0		45.7	8.6	5.7	0.0	100
III. Upper-grade white collar	24.7	33.7	-	41.9	15.7	4.5	100
	19.4	23.9		21.3	23.9	1.5	100
IV. Lower-grade white collar	7.0	8.9		-	34.2	8.0	100
	4.2	21.0	27.3		42.6	4.9	100
V. Skilled manual and routine non-manual	6.7	3.3		15.9	-	38.4	100
	4.3	13.8	22.4	38.8		20.7	100
VI. Semi-skilled and unskilled manual	0.3	1.2		8.7	70.0	-	100
	0.5	4.0	13.1	18.5	63.7		100

*Rio de Janeiro is given in upper right and Sao Paulo in lower left.

This pattern means that the lower a stratum on the occupational ladder, the smaller the proportion of its migrants to reach the top. Conversely, the higher a stratum, the smaller the percentages of its migrants to reach the bottom. An opaqueness in the social structure filters both upward and downward mobility. In Rio de Janeiro, nearly 25 percent who left the upper-grade white-collar stratum moved up into the professional and administrative category. The percentage is almost exactly the same for those who moved from the managerial and executive group into the professional and administrative stratum. But below strata II and III, a distinct break appears. Only 7 percent of the lower white-collar workers reached the top stratum. Skilled manual and routine non-manual sons had a similar percentage. Less than one out of 100 mobile semi-skilled and unskilled manual sons reached the top stratum, and only about one out of 100 reached the managerial and executive level. Obviously, the chance of movement into the top levels varied greatly from strata to strata.

The concern with upward mobility should not obscure the importance of downward movement. In the four strata where the risk of downward mobility existed, downward mobility was pronounced.¹ In Rio, 75 percent of the mobility from the managerial and executive stratum was downward; for Sao Paulo, the percentage was much lower (40 percent), but still substantial. The mobile upper-grade white-collar sons experienced a high degree of downward mobility both in Rio de Janeiro (about 42 percent) and in Sao Paulo (about 57 percent).

¹In the case of Stratum I, all mobility is downward, while for Stratum VI, all mobility is upward.

The heterogeneity of strata. In Table 4 the data are not examined in terms of outflow from a stratum but rather in terms of inflow into a stratum. The concern is with the percentage of those in a stratum who were born in it (homogeneity) or moved into it (heterogeneity). Outflow and inflow approaches to understanding mobility have often been confused; they are complements rather than substitutes because each requires a different organization of the data and presents an entirely different perspective on mobility.¹

The present outlook is that of inflow. Based on what has been discovered in highly industrialized countries, it would be expected that a higher degree of homogeneity exists in the lower strata.² This expectation is confirmed by the data.

The most compelling impression from Table 4 is the high degree of heterogeneity in both cities for all but the bottom-most stratum. In both Rio de Janeiro and Sao Paulo, the managerial and executive stratum is the most heterogeneous -- more than three of every four persons in this stratum were born in other strata. While the managerial and executive stratum has

¹Evelyn Waugh has given an amusing example of the differences in perspectives. According to him, the English working classes contend, quite rightly, that a small percentage of their sons enter the elite positions of British society. The British elite contend that they are inundated by persons from low status families. Both situations can occur simultaneously. A small percentage may move from the large number of working classes families, but as they enter a very much smaller number of elite positions, they may constitute a sizeable percentage of the elite. From the point of view of working-class outflow, a low proportion have made the jump from cloth cap to top hat; from the perspective of elite inflow, they are a large percentage of all the elite.

²This finding has been observed in two previous studies. Cf. Herrington J. Bryce, S. M. Miller and Thomas Fox, "The Heterogeneity of Social Classes in Industrial Societies: A Study in Social Mobility," (Paper presented at the Spring Meetings of the Eastern Sociological Association, New York City, April, 1963, mimeographed); and Thomas Fox and S. M. Miller, "Intra-Country Variations: Occupational Stratification and Mobility," in Richard L. Merritt and Stein Rokkan (eds.), Comparing Nations, New Haven, Conn: Yale University Press, 1966.

47

TABLE 4
TOTAL INFLOW INTO VARIOUS STRATA
(In percentages)

Occupational Classes (1)	Rio de Janeiro (2)	Sao Paulo (3)
I. Professional and administrative	61.4	54.2
II. Managerial and executive	78.0	85.2
III. Upper-grade white collar	75.4	63.8
IV. Lower-grade white collar	61.2	60.4
V. Skilled manual and routine nonmanual	58.1	62.6
VI. Semi-skilled and unskilled manual	18.9	21.6

Source: See Table 1.

the highest level of inflow, all the others (except the unskilled and semi-skilled) have over 50 percent inflow mobility. This finding suggests that achievement criteria and opportunities may be of greater importance for the managerial and executive stratum than for others.

Four out of five semi-skilled and unskilled manual workers were born in similarly placed families. The declining relative importance of this stratum (see Table 1) has meant that comparatively few have been recruited from higher-level families. The similarity of social background in this

48

stratum compared to higher strata may encourage a stratum solidarity beyond that of the more heterogeneous higher-level strata.¹

Table 4 has indicated the overall importance of new persons in each stratum, but it has not revealed the location in the occupational structure from which the in-mobiles came. Table 5 presents these details, showing the percentage of the new entrants who came from each of the various strata.

As would be expected, the distribution of newcomers is not even. Paralleling the experience of outflow, those entering a stratum, with the exception of the Rio de Janeiro professional and administrative and the Sao Paulo managerial and executive strata, are most likely to be from the adjacent or next-to-adjacent strata. As a result, the semi-skilled and unskilled manual sons form a small percentage of the professional and administrative and managerial and executive groups. In turn, the latter two strata furnish even a smaller share of the newcomers to the bottom three strata: Nearly 80 percent of all newcomers to the semi-skilled and unskilled manual stratum came from the skilled manual and routine nonmanual group.

What is most surprising and impressive about the information given in the table is that almost 30 percent of the new professional and administrative stratum in Rio de Janeiro originated in the skilled manual and routine nonmanual stratum. In Sao Paulo, slightly more than 30 percent of managerial and executive workers were born in the bottom two categories. The importance of low-born sons in high status positions is demonstrated in both cities -- emphasizing the role of upward mobility.

¹The evidence on this point is conflicting. It may be that the most radical of the bottom stratum are those who have been downwardly mobile. The combination of a sizeable slice (one-fifth who are downwardly mobile) with a large group that may have developed a consciousness of kind through sharing of social position over two generations may be most likely to produce a restless working class.




TABLE 5
THE SOURCES OF HETEROGENEITY: VARIOUS STRATA IN RIO DE JANEIRO AND SAO PAULO*
(In percentages)

Occupational category	Entrants from other occupational levels						Total
	(1)	(2)	(3)	(4)	(5)	(6)	
I. Professional and administrative		13.6	27.2	27.2	29.6	2.5	100.1
II. Managerial and executive		35.9	33.3	15.4	12.8	2.6	100.0
	19.8		31.2	29.2	12.5	7.3	100.0
	14.5		19.3	36.1	19.3	10.8	100.0
III. Upper-grade white collar	11.0	9.6		43.5	18.9	16.9	99.9
	8.3	13.3		32.5	21.7	24.2	100.0
IV. Lower-grade white collar	1.1	0.7	7.1		47.9	43.1	99.9
	2.7	2.7	18.6		39.8	36.3	100.1
V. Skilled manual and routine non-manual	0.6	0.4	2.6	20.0		76.4	100.0
	0.0	0.9	1.2	27.6		70.3	100.0
VI. Semi-skilled and unskilled manual	0.6	0.0	2.4	14.9	82.1		100.0
	0.0	0.0	3.1	21.9	75.0		100.0

*Rio de Janeiro is given in upper right and Sao Paulo in lower left. For example, row I, column (2) shows that of all persons in professional and administrative work whose fathers were in some other occupation 13.6 percent were sons of managers and executives in Rio de Janeiro as compared with 35.9 percent in Sao Paulo.

Note: Details may not add up to 100 percent because of rounding errors.

Source: See Table 1.

The general pattern is for all strata to recruit the newcomers from the strata below them rather than from strata above (with the exception, of course, of the lowest strata which has most of its recruits from the stratum immediately above). How this affects the difference between outflow and inflow patterns is in part demonstrated by the professional and administrative category in Rio de Janeiro; 56 percent of all who left this stratum terminated in upper-grade white-collar work (see Table 2) but they accounted for less than 10 percent of all who entered the latter group.

Equality of mobility opportunity. If there were complete equality -- all sons had an equal chance to enter any other occupation -- the distribution of each row should be as it is in the sons' columns of Table 2. Comparing Table 2 and Table 5 reveals the inequality in the distribution of non-inherited positions. Many more sons of lowly origins would be found in upper level positions if these sons were equally represented. For example, in Rio de Janeiro, unskilled and semi-skilled sons would constitute about 31 percent of those in the professional-administrative level, instead of less than three percent. One exception to the under-representation of the bottom two groups occurred: in the case of the Rio professional and administrative stratum, where the skilled manual and routine nonmanual category is represented as would be expected on the basis of its numbers.

Implications

What can be concluded from the data thus far? The patterns of occupational mobility in Brazil can hardly be held responsible for its relatively limited development. These patterns conform generally with expectation and the experience of developed countries, but as was noted at the outset, social mobility is a multi-dimensional variable and in this study only the

flow of persons among occupations has been isolated. Perhaps, it is also time for exploring these other dimensions of mobility. How important are they in development? How important is education in promoting mobility?

Education and mobility. As would be expected, education and occupational mobility (see Table 6) are related, but not tightly. In Sao Paulo, the correlation between education and mobility is .38, a strong and statistically significant correlation although not a very high one.¹ The data in Table 6 and their interpretation have to be treated carefully since the three categories of "higher," "lower" and "same" are quite varied internally.

The significance of university education for mobility is revealed in the finding that those with that level of education have the highest percentage who are in a higher strata than their fathers (just under 50 percent). The university educated group also has the smallest percentage of downwardly mobile. Only about 12 percent of those who have university education occupied positions lower than those to which their fathers belonged.

Because of the size of the category, those with primary education are the majority in each row. To compare the importance of different levels of education, the column percentages have to be examined. Here, it is revealed that those with primary education are more likely to be upwardly mobile than those with secondary education and are less likely to be downwardly mobile than those with secondary education. While in the categories of both university and primary education the number of upwardly mobile is

¹This statistic, Guttman's coefficient of predictability, is used for finding correlations among groups. See Linton C. Freeman, Elementary Applied Statistics, New York: John Wiley & Sons, Inc., pp. 71-78.

TABLE 6

EDUCATIONAL ATTAINMENT AND MOBILITY IN SAO PAULO, 1958-1959

Occupational Status of Son Relative to Father (1)	Educational Attainment			TOTALS (5)
	Primary (2)	Secondary (3)	University (4)	
1. HIGHER	60.7 (173) 40.6	19.3 (55) 31.1	20.0 (57) 48.3	100.0 (285)
2. SAME	60.1 (184) 43.2	24.5 (75) 42.4	15.4 (47) 39.8	100.0 (306)
3. LOWER	53.1 (69) 16.2	36.2 (47) 26.6	10.8 (14) 11.9	100.1 (130)
TOTALS	100.0 (426)	100.1 (177)	100.0 (118)	(721)
$\chi^2 = 12.50; \quad 4df; \quad P < .02; \quad \lambda = 38.4$				

Notes: (a) Details may not add up to 100 percent because of rounding errors.

(b) The absolute frequency in each cell is given in parentheses.

(c) The upper right figure in each cell of Table 6 gives the percentage of the row total (e.g. what percentage of those in higher statuses than their fathers had a primary education). The lower left figure in each cell tells of the distribution of education by relative status (e.g., the percentage of secondary school graduates who have positions lower than their fathers).

Source: See Table 1.

two or three times that of the downwardly mobile, the secondary education category shows an almost equal amount of rising and falling mobility. If these findings on secondary education are supported by later studies, they suggest the precarious nature of this level of education: apparently it is not effective in providing a strong guarantee of upward movement nor is it even capable of protecting middle-class sons against social descent.

On the other hand, the row showing all those in higher positions indicates that roughly 61 percent of the upwardly mobile have primary education. This result is not surprising since much of the upward mobility came from the manual stratum. The finding does suggest, however, that for at least short-range mobility, education may not be crucial.

Education and occupational status. Table 7 presents the educational characteristics of individuals in a given occupation (the upper right of rows) and the occupations of those of a given educational level (the lower right of columns). The data refer only to Rio de Janeiro. Almost all (92.6 percent) of those in professional and administrative occupations are university graduates. It was the only occupation with such a dependence upon a particular level of education for recruiting members. No one with incomplete university education entered the professional and administrative category, while 7.4 percent from lower levels of education did. This suggests that the non-university members of the uppermost stratum are probably older individuals who entered the occupations before educational credentials gained their present-day importance. The likelihood of entering this category without a university degree in the future will be even smaller.

The managerial and executive level is much more educationally diverse than the professional and administrative. While more than two out of five

TABLE 7

EDUCATION AND OCCUPATIONAL STATUS IN RIO DE JANEIRO, 1963-1964
(In percentages)

Occupational Status (1)	Educational Attainment							TOTAL (9)
	No Formal Education (2)	Primary (Incomplete) (3)	Primary (Complete) (4)	Secondary (Incomplete) (5)	Secondary (Complete) (6)	University (Incomplete) (7)	University (Complete) (8)	
I. Professional and Administrative	1.1 0.8	0.0 0.0	0.0 0.0	4.2 0.5	2.1 2.9	0.0 0.0	92.6 51.8	100.0
II. Managerial and Executive	0.0 0.0	0.8 0.2	3.0 1.0	28.6 8.4	26.3 27.1	5.3 41.2	36.1 28.6	100.1
III. Upper-Grade white collar	0.0 0.0	5.5 3.9	13.4 10.1	20.7 32.5	47.0 42.9	3.1 52.9	10.3 17.8	100.0
IV. Lower-Grade white collar	1.6 2.4	18.7 11.1	24.4 15.4	8.5 27.3	46.3 15.0	0.4 5.9	0.0 0.0	99.9
V. Skilled manual and routine non-manual	4.8 21.0	32.1 40.2	39.0 52.4	2.9 25.8	20.8 10.7	0.0 0.0	0.4 1.2	100.0
VI. Semi-skilled and unskilled manual	23.3 74.8	48.4 44.6	21.5 21.1	0.5 5.5	6.0 1.4	0.0 0.0	0.3 0.6	100.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Note: Details may not add up to 100 percent because of rounding errors.

Source: See Table 1.

persons at the former level (41.4 percent) were university graduates or persons with some university education, over half (54.9 percent) were persons with only secondary education. Those without a university education can still become managers and executives, although those with primary education or less have little chance to enter those occupations.

Upper-grade white-collar workers came predominantly from the secondary level: 47.0 percent were secondary school graduates and 20.7 percent had received some secondary education. Those with university education (13.6 percent) were somewhat fewer than those with primary education or less (18.9 percent).

The lower-grade white-collar workers show the decreasing role of education as the occupational leader is descended. While secondary school graduates were in the same percentage as they were in the upper grade workers category (about 47 percent), a much higher percentage (44.7 percent) had primary education or less, and almost none had any university experience. The lower-grade white-collar position is a mixed occupation with almost as many coming from those with a primary education (or less) as from the ranks of those with secondary education.

The skilled manual and routine nonmanual category drew 75.9 percent of its personnel from among those with no more than primary education. Yet, one out of five were secondary graduates, a revelation of the educational diversity within the occupation.

Persons with little or no education formed most of the semi-skilled and unskilled manual labor force: 93.2 percent had no more than a primary education. Surprisingly, 6 percent had completed secondary school.

These data show that higher education is needed to enter the topmost occupational level; secondary education to enter the next two (managerial

and executive, upper-grade and white-collar). While some (perhaps minimal) education is important for the lower-grade white-collar, skilled manual, and routine nonmanual occupations, its role clearly becomes less significant.

The column distribution indicates what happened to those who had varying levels of education. Those without formal education entered manual work (95.8 percent). Those with limited education had little or no chance of making the top two categories but did find their ways to some extent into the lower white-collar category and to much greater extent into the bottom two categories. Those with some secondary education had less chance than secondary graduates to enter the top two categories (8.9 percent to 30.0 percent). The major difference is in the greater movement of secondary graduates into the upper-grade white-collar jobs. Those with university education are concentrated in the top three categories.¹

These data indicate that a low level of education does not completely rule out a higher level occupation, but no formal education guarantees a low position in the occupational structure. At the other extreme, university education assures a fairly high position.

Some implications. A comparison of the findings in the last two tables leads to the discovery that every level of education serves as a vehicle for occupational mobility, although the role of secondary education is not as clear as the role of university and primary education. If one may generalize from the Brazilian case, this finding implies that underdeveloped countries which simply wish to produce a lot of upward mobility may choose between two extremes: (a) the most expensive extreme of university education,

¹Further information on education and society in Brazil may be obtained from Robert J. Havighurst and Robert Moreira, Society and Education in Brazil, Pittsburgh, Pa: University of Pittsburgh Press, 1965, esp. pp. 95 - 112.

53

or (b) the least expensive extreme of primary education. The rational choice between these extremes must involve a deep consideration of the question, what occupations does the nation wish people to enter. In short, educational planning for making a social system fluid is likely to be wasteful unless some decision concerning the "where-to-and-where-from" of persons governs such planning.

Table 7 suggests that individuals generally enter the occupations which best utilize the education they have received. The fact that there was not 100 percent conformity between the education of a worker and his occupation, i.e., all persons with university education did not have employment in the upper strata, hints at some waste in the utilization of human resources. This waste can be reduced or become more tolerable if a few factors are taken into account in planning for social mobility through education: (1) because of bias and prejudices existing in the stratification system of all societies some persons will be barred from certain occupations despite their educational qualifications; (2) the process of choice of occupation is a complex one and is not constrained completely by education because an individual takes into account a number of other factors when choosing an occupation; and, (3) the downward mobility of persons with university education is not all negative because lower occupations often provide grooming for future success in upper-level jobs.

Education and Social Origin in Argentina

The concern here is not only with the impact of education but also with the question of who is receiving the education. Table 8 presents data from Buenos Aires showing the decided impact of social origin on the educational level that males achieve. The lower the occupational level of the father,

58

TABLE 8
LEVEL OF EDUCATIONAL ATTAINMENT BY OCCUPATIONAL
CLASS OF FATHER, BUENOS AIRES, 1960-61

Occupational Level of Father	Educational Level Attained by Sons					
	Without Education	Primary Incomplete	Primary Complete	Secondary Complete or Incomplete	Perce- tage	Number
I. Unskilled manual	7.0	49.9	33.4	2.7	100.0	341
II. Semi-skilled and skilled manual	4.0	30.0	48.4	3.1	100.0	454
III. Lower white collar	4.2	24.9	41.6	6.7	100.0	382
IV. Middle white collar	0.0	12.5	40.4	13.2	100.0	136
V. Technical and professional	1.3	6.6	28.9	18.4	100.0	76
VI. Medium size business- men and free professionals	3.7	19.0	28.2	19.0	100.0	216
VII. Large industrialists and high officials	0.0	0.0	3.3	50.0	100.0	30

Source: Gino German, La Movilidad en la Argentina, Servicio de Documentación de Sociología, Publicación Interno No. 60, Instituto de Sociología, Facultad de Filosofía y Letras Universidad de Buenos Aires, p. 29.

59.

the less the education of the son. (If such data were available by age groups, the changes taking place over time could also be observed.) Within this pronounced trend, two findings are most pertinent: Category VI (medium-size businessmen and free professionals) is less likely to have sons with high education than most white-collar occupations; note, for example, the 22.7 percent with no education or incomplete primary education. The two categories at the bottom of the social ladder (categories I and II) have a small but noticeable number of sons who have managed to get some secondary or university education (9.7 percent in category I and 17.6 percent in category II).

The achievement of an education is strongly linked to social class in Buenos Aires and in South America in general. To what extent education has an effect on occupational chances independent of family status has not been determined. It may be, for example, that those born in upper-level families are likely to have more high-level jobs, not because of their education, but because of family influence. Data for other nations suggests that clan status weathers the impact of education, i.e., of two individuals with the same education the one of higher social origins is likely to have a higher level occupation or to be at the higher level of the same occupation. A person of high social origins and low education may do as well as a person of low origin and high education.

As education becomes more important in a society, the impact of social origins as a force independent of education is likely to weaken. But the speed and depth of its reduction are likely to be important political issues. How can increasing equalization be assumed to flow automatically from increasing education? Increasing equality may have to be a deliberate policy rather than a by-product of educational expansion.

60

The Promotion of Social Mobility

Modes of increasing social mobility have been approached in two ways:

(1) structural and aggregative, and (2) familial and individual.

The structural approach emphasizes changing the opportunity and incentives for large aggregates to be mobile. The effort here is to increase the numbers who have the potential for mobility by expanding educational facilities or through other types of broad-scale efforts. The approach can be through increasing the necessity for individuals to be mobile by increasing the demand for them in other occupations or through increasing the supply of potentially mobile individuals.

A study has been made which explored a multiplicity of variables that may affect the rate of social mobility. These variables included national product per capita, education, political stability, urbanization and motivation.¹ Education alone explained 80 percent of the variance in manual outflow. The higher the level of educational attainment by a nation, the lower the amount of the downward mobility, and the higher the percentage of upward movement.² These findings are presented in Table 9 to demonstrate the supreme importance of education in upward social mobility.

¹Education was measured by primary and secondary school pupils enrolled as a percentage of population, aged 5-19; economic development was measured as gross national product per capita; urbanization was measured as percentage of population in localities 20,000 and over; motivation was measured by McClelland's index of achievement motivation; and political stability was measured by Lipset's dichotomy of stable and unstable democracies. The countries included in the study were Denmark, Finland, France, Great Britain, Hungary, Italy, Japan, the Netherlands, Norway, Sweden, the United States and West Germany. See Thomas G. Fox and S. M. Miller, "Economic, Political and Social Determinants of Mobility: An International Cross-Sectional Analysis," Acta Sociologica, 1966.

²For an expression of strong skepticism regarding the ability of education to play a key role in promoting vertical mobility, see: C. Arnold Anderson, "A Skeptical Note on the Relation of Vertical Mobility to Education," The American Journal of Sociology, Vol. LXVI, No. 6, 19, May 1961.

61'

TABLE 9
MATRIX OF SIMPLE CORRELATIONS AMONG
MOBILE AND OTHER VARIABLES

Variables	X ₃	X ₄	X ₅	X ₆	X ₇
X ₁ Manual Outflow Mobility	.569	.803	.503	.417	.451
X ₂ Nonmanual Outflow Mobility	-.270	-.149	.385	.475	.441
X ₃ Gross National Product Per Capita	1.00	.571	.626	.372	.487
X ₄ Primary and Secondary School Enrollment		1.00	.373	.593	.444
X ₅ Political Stability			1.00	.443	.192
X ₆ Population in Localities over 20,000				1.00	.199
X ₇ Achievement Motivation					1.00

Source: Thomas G. Fox and S. M. Miller, "Economic, Political and Social Determinants of Mobility: An International Cross-Sectional Analysis," Acta Sociologica, 1966.

621

Economic expansion by itself does not seem to be adequate to foster mobility.¹ Economic growth may occur simply through a proportionate increase in all factors of production with little mobility across the manual-nonmanual occupational boundaries, or growth may be related to geographical shifts in the labor force with more horizontal than vertical mobility. Further, the degree of occupational mobility, i.e., across the manual-nonmanual divide, depends upon the sector which is being developed. The expansion of a service sector may produce the highest rates of such mobility.²

Because of the significance of education, it has been suggested that a widespread increase in educational opportunities will greatly increase actual rates of mobility. In addition, large-scale expansion of education might have the value of augmenting the number of youths from lower social strata who have access to education. Smelser and Lipset note that expanding various forms of educational opportunities in rural and isolated areas

¹This finding corroborates those of earlier studies, S. M. Miller and Herrington J. Bryce, "Social Mobility and Economic Growth and Structure," Kolner Zeitschrift fur Sociologie, Summer, 1962; and Herrington J. Bryce, "Immobility and Economic Development: A Comparative Analysis," (paper presented at the Eastern Sociological Society, Philadelphia, 1966).

²The assumption that the growth of a service sector produces more manual-nonmanual mobility is based on Clark's theorem. See Colin Clark, The Conditions of Economic Progress, London: Macmillan Company, 1951. This theorem has not gone unattacked; Cf. P. T. Bauer and B. S. Yamey, "Economic Progress and Occupational Distribution," Economic Journal, 61, (1951) pp. 741-55; A. L. Minkes, "Statistical Evidence and the Concept of Tertiary Industry," Economic Development and Cultural Change, 3 (1955), pp. 366-373; Simon Rottenberg, "Note on Economic Progress and Occupational Distribution," Review of Economics and Statistics, 35 (1953), pp. 168-70; Margaret S. Gordon, Employment Expansion and Population Growth, The California Experience: 1900-1950, Berkeley: University of California Press, 1954, p. 30; and S. M. Miller, "Tertiary Employment and Occupational Mobility," Sociological Society, New York, 1955.

increases the possibility that graduates of these programs will be willing to work in these areas rather than concentrating in urban regions. In turn, a more effective distribution of the educated among rural and urban regions will affect the possibilities of gaining more educated and mobile persons in the following generation because the number of qualified teachers available to rural youths will increase and new kinds of role models will be available to the youth in rural areas.¹

Another structural factor is that of urbanization. For many, the move from rural areas and agricultural occupations into urban areas and industrial occupations is an advance in economic and social status. The change may also be a gain in political status since rural areas are more likely than urban areas to have de facto limitations on the role of the citizen. For others, however, the shift may not represent upward mobility but horizontal mobility. (For a few, there may be a decline in status.)

The most significant mobility gain may, however, be exhibited in the generation which succeeds the migrants to the cities. For this urban generation will have had better opportunities for education in the cities than it would have had in the rural areas and will be more acutely aware of the possibilities and routes of social mobility. The improved educational opportunities are not automatic, however, for the urban centers have to construct schools and create the teacher-pupil environment which lead to better education. In the United States, for example, the migration of Negroes and poor whites from rural areas led to concentrations of poverty in the cities. While the education they received in the cities was, in the main, much superior to that available in their former homes,

¹Neil Smelser and Seymour Martin Lipset, "Social Structure, Mobility and Development," in Smelser and Lipset (eds.), Social Structure and Social Mobility in Economic Development, Chicago: Aldine, 1966.


it was not good enough to put these Negroes and poor whites in a strong position in the competitive race for mobility in the large city where educational qualifications were higher than in rural areas. Much current educational activity in the United States is devoted to changing this situation.

Urbanization does not automatically result in enhanced social mobility opportunities, but it does provide a framework which may be more economical than that of most areas in promoting mobility. Efforts to promote urbanization, despite immediate social costs, are seen as contributing to increased mobility.

Moore has suggested a different kind of structural approach to the promotion of mobility. To reduce family ties which impede social mobility, he suggests that "developmental strategy should emphasize forms of association and also such provisions of social insurance as are financially feasible. Social insurance is likely to be regarded as a luxury available only to prosperous countries. The suggestion here is that it be given higher priority because of its importance as a device for social transformation."¹

The Moore analysis emphasizes the supply side of mobility -- the interest and availability of individuals for mobility. Kingsley Davis has suggested another set of variables in increasing the demand for individuals to be mobile. He argues that developing regularized modes of entry into occupations instead of dependence upon family and connections promotes mobility. "Such things as public schools, recruitment by examination, wages geared to productivity, licensing of professions, up-to-date patent and copyright laws are thought of in terms of national efficiency rather than

¹Wilbert E. Moore, "Problems of Training, Balance and Priorities in Development Measures," Economic Development and Cultural Change, 2, 1954, p. 248.



in terms of class circulation, but they have an effect in stimulating the latter nonetheless."¹ The reduction of particularistic requirements and substitution of universalistic and achievement oriented criteria for entry into and achievement in occupations may make it possible for those at the lower social levels to advance. On the other hand, some societies have utilized particularistic criteria to augment opportunities for those at the bottom. Several Eastern European socialist societies at various points have limited the number of the middle class students at universities in order to favor the offspring of workers; some U. S. universities have relaxed entrance requirements and organized special efforts to gain Negro students. Traditional, particularistic criteria in general operate against the lower classes but particularistic professions which single out those at the bottom for favorable attention can serve to improve, at least in the short run, their mobility chances.

The thrust of the structural approach is to build the institutionalized mechanisms (whether of education, economic change, or social insurance) and not to bother much with the sorting process and the individual difficulties of gaining ascent. Obviously, however, individuals do not benefit equally from expanded opportunities, for selective factors of various kinds affect who may and who may not profit.

The familial and individual approach looks at the problem from the other side -- who are those who move ahead and how can their mobility be quickened? This approach may suffer from the strong individual emphasis; for some analysts write as though the mobility pressures from individual and family are effective regardless of economic and social circumstances. While some

¹Davis, op. cit., p. 72.

66

can move ahead despite difficult circumstances external to them, large numbers cannot.

The studies of mobility determinants from the individual and family side concentrate on the movement from manual to non-manual occupations. The general sense of the studies is that the mobile are more likely to be better off than those in the same strata who are not mobile. This result occurs, in part, because the manual category is so broad, but other things are operating here.

The mobile person is in many ways more like others in the stratum into which he moves than like those in the stratum from which he originates. He is probably of higher measured I.Q. than nonmobile manual persons. Taussig and Joslyn, in their study of American business leaders, presented evidence that sons of manual workers who entered upper business levels were generally of measured intelligence superior to that of sons of other manual workers.¹ In general, the mobile manual son is more likely than the nonmobile son to have a parent with more than average education for the manual stratum.

An important reason for the superior background of the mobile manuals is that they are more likely to have had a grandfather who was in the non-manual category. Of two children of the same status level, the one with a grandfather of higher status is more likely to improve his position. The family that has been downwardly mobile is more likely to have offspring that will eventually rise in social status. How can the functional equivalent of having a middle class grandfather be provided?

The advantages of having a higher level manual family consist of at least these elements: knowledge, stimulation, motivation, attitudes, rewards,

¹Frank M. Taussig and C. S. Joslyn, American Business Leaders, New York: The Macmillan Company, 1932.

confidence, models, financial assistance. In offering the following comments, there is no pretense at comprehensiveness. The concern is with illustration. Examples have been drawn primarily from the United States, not because they have worked better than procedures elsewhere, but because they are better known. The intention is not to encourage the adoption of the particular illustration but to indicate the kind of activities which could be pursued. (Indeed, some of the examples have not been effectively developed in the United States.)

Knowledge. Frequently, motivational resistances are introduced as an explanation for the ineffectiveness of educational efforts among the low-educated. One reason for the resistances is that most low-educated people simply have no knowledge about education and school. Persons in the mobile higher-level manual category tend to have understanding of the role of education and the school know-how which leads to effective performance in school.

In the United States, for example, many Negro parents express high interest in the education of their children. Nonetheless, offspring of these interested parents frequently do poorly in school and are early school leavers. The parents do not know how to translate their concern into aid for their children in school. They lack understanding of what the school demands of them and what they can do to help their children. One element of a successful program in St. Louis, Missouri, was to make clear to the parents how much homework was expected of their children each night. The parents could then make appropriate demands of their children.

Similarly, students frequently do not understand what the school is demanding of them in terms of classroom attention and work. Youth from higher-educated families learn quickly what is expected of them in school.

Some early home demands may deliberately mirror the later school demands in order to prepare the child for the school setting. Schools attempting to attract, keep and develop children from low-educated families should not assume that attendance at school automatically insures awareness of school expectations. The school may have to provide concrete and vivid leads as to what is expected rather than relying on the child (or his family) to learn rapidly and easily "the school ropes."

Educational support. As indicated previously, well-motivated parents may not know how to help their children in school. Aside from helping the parents to work more effectively with their children, the schools can adopt programs of a supportive nature which facilitate educational advance for those from low-educated families. For example, a number of low-income communities in the United States have recently been provided with homework centers, in and out of school, where children from crowded or noisy homes can do their homework and have needed library facilities. In some places, homework helpers are provided to aid the student in his studying, a task which a highly-educated parent is likely to assume with his children.

Stimulation. The high mobile-potential family is likely to stimulate its child toward educational progress by providing educational-like pre-school experiences at home, by heavy parental involvement in school and educational activities, and by the utilization and reinforcement at home of school achievements.

Similar stimuli can be provided by distributing free books to be looked at and read at home. This can start even before the child has entered school. In the United States, one stress in some schools in low-income areas is the adoption of teaching techniques which are more stimulating to

69

students who, because of their backgrounds, do not find traditional school programs of great intrinsic interest.

Motivation. Many of the upwardly mobile have been pushed by members of their family or some outsider, especially a teacher. If the family cannot be relied on to promote effective motivation for investment in educational activities, then the school can assume this role. By taking a personal interest in children from low-educated families, the teacher may be able to develop in them an interest in and concern about school.

An appropriate setting is necessary for motivation of the students. Channeling students into different types of curricula at an early age tends to reduce the number who go on to higher education. Frequently, the "lower-level" program gets less funds and less adequate teachers. Often, all students in these curricula are considered lacking in potential and teachers may not devote themselves wholeheartedly to their development. The labeling process is important; the way a student is classified is likely to determine his progress. For example, in one school system in the United States some students who should have been assigned into high-level Group A on the basis of their scores were put into low-level Group B, while others who should have gone into Group B were placed in Group A. When the mistake was discovered, it was learned that the B-level students in Group A had done better than the A-level students in Group B. The way the students were viewed by their teachers deeply affected their progress in the schools.

If a school system does have a system of tracks to separate students with some homogeneous characteristics, then there should be a requirement that a minimum percentage of students do actually move from one track to another. In Great Britain, while it is theoretically possible to move from the non-college preparatory to the college preparatory track, few actually

do make the move. Merely providing a mechanism for transfer without actually using it is meaningless; a minimum requirement about transfers will at least force attention to the issue of periodic review of student interests and performance. Since students can never be completely adequately classified and since they do change and develop over time, the route for movement in and out of a track should be well traveled. Some analysts strongly advise, at least in the United States contexts, against any form of tracking because it impedes social mobility (those from low-educated families are most likely to be placed in the slow track). Further, tracking may stereotype students and discourage schools and teachers from assuming the responsibility of expanding the capabilities of all students.

Obviously, in rural areas of industrializing societies, several educational tracks are unlikely to exist within the same community. But for the nation as a whole, they may operate. A society concerned about social mobility as well as the development of talent will be concerned about the impact on social roles of the selection procedures of the multiple systems which comprise any educational system.

Reward. The possibilities of reward are an important element in motivation. On the economic level, increased education should lead to improved economic status. If this does not occur, and a nation has unemployment or underemployment in the white collar group, those from low-educated families are discouraged from furthering their education. Educational expansion must be keyed to the effective placing of the increased numbers of graduates in jobs commensurate to their training.

At the psychological level, developing close peer groups of youth interested in education may promote their involvement in school and provide

some immediate returns of satisfaction in the school years. Schools and universities could deliberately plan for the development of positive peer groups.

The reward for effective school performance should perhaps be more frequent than is customary in many school systems. Infrequent and vague reports should be supplanted by frequent and clear indications of status. Rewards might be built up for the family as their children advance in school. Frequently the advance of a child cuts him off from the family. To combat this tendency, the family could be continually involved in the advance of the child through personalized progress reports, public recognition for the family for the work of the child, closer contact between the family, the community, the school and the child. By providing rewards for the family -- not just for the child -- the family may function more effectively in furthering the child's progress. Going up should not automatically mean going out of the family.

Confidence. Closely involved with knowledge at many points is confidence -- in the ability to carry through the educational program; in the eventual significance of the education; in the relation of what one is doing day-to-day to eventual outcomes.

The Dutch sociologist, F. von Heek, of the University of Leiden,¹ has suggested that students of working-class origins would leave Dutch universities less frequently than they do if they had a residential dormitory situation. In the Dutch universities, there is no regular provision of residential quarters for students. They find rooms in town as best they

¹This suggestion was made in the discussions of the Sub-Committee on Social Stratification and Mobility of the International Sociological Association.

-72-

can. The students of working-class origins find this situation more uncomfortable than do the middle class because typically they are less sure of themselves in their new surroundings, less able to make friends and to manage financially. A dormitory situation where students participate in socializing each other in the new situation could increase the upwardly mobile student's confidence in being able to manage the educational obstacles.

Models. The youth of high-educated families constantly see people who have been educated and are occupationally successful. Low-educated youth know fewer models and do not learn of the steps toward mobility that others have taken.

If the family and community cannot easily provide models of mobility, then the school might develop a program which presents living models (see Chapter 6). In some slum areas of the United States in order to promote educational mobility aspirations of Negro youth, successful Negroes have been brought into the schools to describe their ascent. They make real the possibilities and routes of mobility.

Financial assistance. Education is expensive. It is expensive for the state to provide the facilities and staff and expensive for the family to support the student. The expenses of the student and his family include not only the direct costs of maintaining him but also the earnings foregone during the educational period. While it may be economically rational for a family to undertake these expenses in order to benefit from the higher income potential of the youth as he enters and succeeds in the world of work, many families cannot afford this kind of rationality. Only the higher-educated, higher-income families can afford to forego current earnings. Lower-income, low-educated families cannot. Therefore, the provision of

73

adequate financial assistance by the state will augment the number of students and will enhance the upward mobility of those at the bottom of the social structure.

In the United States, several different kinds of procedures serve to promote educational expenditures by the family: special tax advantages (in several states) for families whose children are going to college (this provision benefits the higher-income more than the lower, but may provide some incentive to the latter); the continuation on public welfare of families where children are going to college (formerly, a youth of 18 would no longer be kept on the welfare rolls if he decided to further his education); scholarships to the needy. In nations with family allowance schemes the age at which a child is no longer eligible might be raised if he continues his education. In effect, the family's costs in foregone earnings are reduced.

The general strategy which results from this discussion is to enlarge the school's role to include activities which higher-educated families might perform for their offspring. The school can perform a more effective role through the deliberate fostering of peer-group interaction; the closer intervening of school and community; the examination of school in socio-psychological as well as pedagogic terms. In other words, the effort should be concentrated on building the school as a broad social institution.

An effort has been made to convey the possibilities rather than the difficulties of promoting educational mobility. Obviously, attempts at social engineering can be highly manipulative and can interfere with the liberties of family and community. This danger should not be discounted and competes with the desire to promote educational advance.

74

Conclusion

Development is different today than it was in the past: it is more conscious. Nations want to have great achievements with minimum social upheaval and costs. Multiple goals rather than a single goal are the target. Objectives are publicly stated. Policies are more directed and deliberate than haphazard. Consequently, blame can be apportioned and accountability somewhat measured.

The self-consciousness of contemporary development efforts builds in new strains: the developers are identifiable, decisions may be fairly obvious and usually public, results are to be evaluated. These occurrences contrast with the beginning days of capitalistic industrialization in Western Europe and the United States where much less was publicly scrutinized and evaluated.

The emergence of new strains contributes to the likelihood that large-scale development plans cannot be executed as originally designed; only intermittent progress is likely to occur as intermediate targets are not met, multiple goals compete, and political considerations require adaptations and modifications in targets and pace. The structuring of educational goals and plans so that they are phased and flexible seems to be most appropriate for the kind of development which is likely to take place in many countries -- uneven and tense, requiring shifting adaptations to emergency and exigency.

At this point it is not known how much and what kind of mobility and education are needed for development nor how much development is needed to foster mobility and education. These are issues which require much analysis. But it is already clear that education is becoming the crucial developer and sorter of people in a society. Clearly, too, the caliber of many societies is being measured by the extent to which social justice in the

75

sense of upward social mobility is fostered. Social mobility may not be needed in order to achieve all types of development, but it is becoming an important criterion of the success of development. Social mobility is, thus, not only an instrument of economic progress; it is a major measure of the extent of that progress.

CHAPTER 3

EDUCATION AND NATIONAL INTEGRATION

The task of national integration is crucial both in new states, which must develop an effective consciousness of the existence of the "the nation" among all their people, and in the older states which are just beginning to modernize and where the sense of nationhood has been heretofore almost the exclusive property of a small educated elite. In spite of rapid and ever-increasing urbanization, the vast majority of the people of the under-developed world are likely to live for some time in small villages. Therefore the principle concern here is with the process whereby small communities become "nationalized" and their inhabitants become in a real sense citizens. More specifically we are interested in the role of formal education in the spread of national culture and institutions from the urban centers where they typically originate to the hinterland.

Education can play certain obvious roles in the process of national integration. It develops the manpower resources of the country by providing them with new educational opportunities and new channels for upward mobility. In this way, human resources which may have been unproductive are mobilized and utilized for the country's further growth and expansion. From a more direct ideological viewpoint, the school provides a common institutional system through which all children must pass and through which they acquire a common set of symbols, values, and goals; thus, they learn to salute the national flag, to sing the national anthem, and are told of the past glories of their national heroes. The school provides a framework through which a national ideology can be shaped and formulated, and taught to a large segment of the society at an age when competing values have not yet had a chance to take hold.

97

However, education in the underdeveloped areas is essentially an instrument of government policy, and as such it may be used to widen the gap between certain sectors of the society rather than narrowing it. This can be seen most clearly in the advantage which urban children commonly enjoy in terms of schooling; since most schools, at least beyond the first few elementary grades, are located in towns and cities, rural children must go to extra expense and effort in order to attend these schools and receive more than a primary school education. The result can be observed in statistics from an underdeveloped country such as Haiti, where annual enrollment figures for urban and rural elementary schools differ by less than ten per cent¹ while 87 per cent of Haiti's population lives in rural areas. Similarly, all secondary, vocational and commercial schools in Haiti are located in urban areas, which employ almost 90 per cent of all professionally trained teachers.²

Haiti is admittedly an extreme case, but this phenomenon can be found, in greater or lesser degree, throughout the developing world for the obvious reasons that receptivity is likely to be greater among urban populations and resources there can more effectively be marshalled where the population is densely settled. The real problem is isolating the factors which impede developing countries from repairing the dislocations attendant upon development.

The rural-urban differential is not the only disparity which may be accelerated by the modernization process. The decision to support secondary vs. primary education, private vs. public schools, or scholarships for

¹George A. Dale, Education in the Republic of Haiti, U. S. Department of Health, Education and Welfare, Office of Education Bulletin no. 20, 1959. pp. 49-63

²Ibid., p. 25

university study abroad vs. the development of an indigenous university, all aim at the creation of an educated elite in the society rather than attempting to raise the educational level of a broad public. Of course, where financial resources are limited, as in most underdeveloped countries, such decisions may be necessary and indeed, more suitable for the country's development plans. Not everyone can be supplied with, or wants, everything at the same time. But it should be recognized that such educational policies can retard the process of national integration, by widening the gap between the elite and non-elite sectors of the society. Silvert has described the political implications of this "asymmetry of development":¹

"The obvious result is to impede consensus and the consequent legitimation of a single, coherent series of institutions, and thus to inhibit the generation of the public power which otherwise might permit the employment of massive force to impose a certain minimum compliance with modernizing behavioral norms despite opposing belief systems."

In other words, the asymmetry of development impedes the achievement of a common core of values and institutions upon which the legitimacy of public power is based; without this consensus, the national government lacks the power to mobilize the country in accordance with modernizing norms and the whole process of development is weakened.

Lacking the legitimacy based on consensus, governments may resort to the use of force to impose control on other groups in the society. This would seem to be particularly true of societies which are characterized by sharp divisions along tribal, ethnic, linguistic, religious, or racial lines, each sector maintaining its own values and institutional system. While one of the groups in the society may be dominant in the sense of wielding effective economic and political power, it often lacks either the capacity or

¹Kalman Silvert, Social Modernization: Outline of a Theory, mimeo, 1965.
p. 12

desire to transmit its values and institutions to the subordinate groups it governs. Therefore, the process of national integration is vastly more complex in such societies than in societies with relatively homogeneous subcultures, where the real problem becomes a lack of articulation between the nation-state and its constituent local communities.

In this chapter, we are concerned primarily with the latter problem; that is, with national integration as the process whereby local communities can be brought into closer contact with and control by a national government, based on the principle of legitimacy and a common national ideology. This is achieved not only through an increase in the political power of the central government, but through the incorporation of all people into a common institutional framework through mechanisms such as the market system, political parties, labor unions, and education. The school is the only national-level public institution in which all members of the society, theoretically at least, should spend some years of their lives. They may never join a political party, or serve in the army, or belong to a labor union, but most persons, particularly in the younger age groups, are eligible to attend school. And as educational programs expand in the underdeveloped areas, this is increasingly true.¹

Therefore it is important to spell out for policy makers the contributions which education may make to the process of national integration and to the development of a national ideology based on a core of common values and institutions. We shall look at education as a nation-building institution, as a link between the national society and the local community. Yet

¹Of course, if one interprets political affairs more broadly, or views labor unions as a particular manifestation of the occupational system, then most people participate in these systems, too. The point remains, however, that formal schooling is one of the few national-level institutions, if not the only institution, in which all people are eligible to participate.

80

to do this, we must begin with a thorough understanding of the process of national integration itself. What are the mechanisms by which the local community is tied into the national state? How is the shift from an inward orientation toward the local community to an outward orientation toward the nation-state reflected in the attitudes and behavior of the local villagers? What can be done to speed up the process by which a self-sufficient, isolated community becomes a full participant in the national society? In particular, what contribution can education make to the nation-building process? These are some of the questions which we will attempt to answer.

Definitions of National Integration

While most students of socio-economic development agree on the importance of national integration in the modernization process, the definitions of what constitutes a modern nation-state differ considerably. Usually these differences reflect the various academic disciplines which have worked in the area and their respective emphases on one or another type of institution.

For example, economists were probably the first people to work in the development area and still continue to dominate the scene, both in terms of theory-building and field work. Economists, and those influenced by them, have generally emphasized the growth of an economic infrastructure as a necessary component of the process of national integration. Thus, the establishment of a national currency and banking system, the development of trade, transportation and communication, and even such modern institutions as the stock market are seen as contributing to the process of national integration. Because of the ready availability and identification of economic indicators and the considerable amount of research already done in this area, it is no wonder that most quantitative measures of socio-economic development rely heavily on such items.

81

Many political scientists, on the other hand, emphasize the growth of a "participant society" as indicative of the process of national integration. In their view, as long as a substantial sector of the electorate remains outside the national political system of the country, it cannot be considered a full participant in the life of that society. Thus, political scientists often focus on mechanisms which will broaden the base of political support in a country, such as the development of national political parties, the extension of the suffrage to non-elite sectors of the society, the percentage of the population voting in national elections, and the growth of government functions and services.

Sociologists and anthropologists are only beginning to work in the area of social development, but their theories also tend to reflect their respective disciplinary interests. Thus, a sociologist like Leonard Riessman emphasizes the growth of a middle class as a necessary component of the modernization process.¹ National integration is seen as encompassing a change in the society's stratification system and a widening of the elite base of the society. Anthropologists, on the other hand, frequently emphasize a change in values or ethos as indicative of the process of national integration. Clifford Geertz, for example, speaks of the "integrative revolution" as the "progressive extension of the sense of primordial similarity and difference . . . to more broadly defined groups . . . within the framework of the entire national society."² That is, Geertz envisages the widening of primary group sentiments based on kin, religious or linguistic ties to larger and more inclusive groups in the society.

¹Leonard Riessman, Urbanization and Education in the Development Process, mimeo, 1965. pp. 16-17

²Clifford Geertz, "The Integrative Revolution," in Old Societies and New States, C. Geertz, ed., New York: The Free Press, 1963, pp. 153-154

92

In essence, these various interpretations point up different ways of looking at the process of national integration.¹ Some writers emphasize structural integration, which includes such things as involvement in a market economy, the growth of national institutions which incorporate people at the local community level such as schools, churches and political parties, and whole series of relationships which bridge the gap between the local and national level of society. Cultural integration, on the other hand, would include changes in life styles, educational goals, religious beliefs and practices, values, etc. Attitudinal or psychological integration would stress identification with the nation-state and the growing importance of patriotism and national symbols such as the flag, the national anthem, etc.

No discussion of national integration would be complete which dealt exclusively with one of the above aspects. However, our primary concern here shall be with structural integration, particularly in terms of the process by which local communities articulate with the national state. In agreement with Richard Adams, in a paper on the role of the community in the development process,² we shall emphasize those changes which break down intra-community bonds and promote greater communication and control from the larger political system. Seen from this perspective, the process of national integration involves the increasing absorption of the community into the mainstream of national culture and society and the growing importance of a nationwide system of communication and control directed from above. How this process evolves will become clearer as we examine some theories of community growth and change.

¹We are indebted to Dr. Eruestive Friedl for this observation

²Richard Adams, The Latin American Community in Revolution and Development, Occasional Papers Number 3, Center of Latin American Studies, University of Kansas, 1964, p. 6.

Institutional Differentiation

To gain perspective it is useful to focus first on institutional development at the national level. A number of recent studies have empirically demonstrated what has been theoretically assumed for quite some time; namely, that societal growth involves the systematic elaboration and differentiation of institutions. Phillips Cutright, for example, has developed an index of political development based on the concept that "a politically developed nation has more complex and specialized political institutions than a less politically developed nation."¹ In a later article Cutright developed a Guttman scale of national social security programs, demonstrating that these too developed systematically.²

Illustrations of this process of institutional elaboration and differentiation at the national level in areas of our direct concern are presented in chapter 10. One of the several scales presented in that chapter traces the development of national planning institutions in Latin America. Another scale depicts the institutional differentiation of educational systems, first in Latin America, and then throughout the world, using a sample of 77 countries. The significant point about these scales is not the particular institutions which comprise them but the fact of scaling which allows one to conclude that development within both institutional systems involves progressive differentiation and elaboration of the institutional system. Although these scales measure the nucleated aspect of the institutions involved, it must be remembered that the institutions are composed of networks of people and facilities all over the nation. We would expect, then, that institutional

¹Phillips Cutright, "National Political Development: Measurement and Analysis," American Sociological Review 28(2), April, 1962, p. 255

²Cutright, "Political Structure, Economic Development, and National Social Security Programs," American Journal of Sociology 70, March, 1965

development at the local level would involve the same patterns of elaboration and differentiation. Evidence that such is the case is offered by Frank and Ruth Young, in a series of comparative studies of village level institutional

development, using scalogram analysis in which these researchers conclude that two processes, differentiation and consensus, are involved. As the community is incorporated into a more differentiated social structure the basis of consensus is widened to include national-level culture, which is carried by new national institutions and ideology.¹ The Youngs have further concluded that the more differentiated a community's institutional system the more receptive the community would be to change and further institutional differentiation. This receptivity is complemented at the individual level by the adoption of urban or "national" behavior, which indexes "a sub-strata of urban ideas, aspirations, and orientations."²

The Youngs further found by using data both from Mexican communities and a world-wide sample of communities, that the institutional differentiation is unidimensional, that is, that there is a "single sequence and direction of community articulation."³ The Youngs interpret from their scale that communities pass through three stages of institutional development. In the first stage are those institutions which are concerned with developing or maintaining community autonomy. This stage includes such scale items as: "a named and autonomous locality group" and "one or more governmentally designated officials." A second phase, traditional or representative contact with the nation, includes as scale items a school building, a government building, access to electric power, or a written language. The third stage, "pervasive interpenetration with the national structure,"

¹Frank W. and Ruth C. Young, "The Sequence and Direction of Community Growth: A Cross-Cultural Generalization," Rural Sociology 27 (4), Dec., 1962, p. 382.

²Youngs, "Social Integration and Change in Twenty-four Mexican Villages," Economic Development and Cultural Change, 8 (4) Part 1, July, 1960

³Youngs, "Sequence and Direction of Community Growth," P. 377.

86

includes for the world-wide sample the scale item "formal education with a full-time specialized teacher," or for the Mexican sample a school with four or more grades, a village market patronized by people from other villages, and a public monument.¹

Community-Nation Articulation

A crucial question with respect to national integration is how the articulation of village-level and national level institutions takes place. The work of Julian Steward provides a clue. According to Steward, the process of sociocultural integration does not consist merely of the incorporation of more numerous and diversified parts or communities, but in the growth of functional interdependence between these parts.² In complex societies, this functional interdependence is accomplished through special social groups which Steward calls horizontal segments and through formal national institutions. These horizontal segments consist of occupational, class, caste, racial or ethnic groups which cut across localities and bind segments of communities into new, national subcultures. The formal, national institutions such as money, banking, trade, education, the legal system, the army, and churches, constitute the infrastructure which holds the society together at

¹Ibid., pp. 376-379. That these patterns are neither local to the villages studied by the Youngs nor found only among certain types of institutions is demonstrated in the work of Norman Whitten (Norman E. Whitten, Jr., "Power Structure and Sociocultural Change in Latin American Communities," Social Forces 43, March, 1965). Whitten developed an index of community power structure in order to test the hypothesis that "as community power becomes increasingly rationalized (rational refers to the systematic centralized arrangement, secularization, and impersonalization of the ability to influence activities), the local sociocultural system will become less parochial and increasingly similar to the national system." Farrell has found, using Whitten's data for 17 Latin American communities, that the variables used by Whitten also form a scale, indicating that community growth along this institutional dimension also follows a single direction.

²Julian Steward, Area Research: Theory and Practice, Social Science Research Council, Bulletin 63, 1950, pp. 107-8.

-82-

the national level.¹

Building on Steward's theory of sociocultural levels, Eric Wolf has emphasized the significance of the horizontal segments in the process of national integration. According to Wolf, these "nation-orientated groups" follow ways of life quite different from that of their community-oriented fellow villagers. They are often agents of national institutions, such as the school teacher, the policeman, or the tax collector, and as such, act as mediators and interpreters between the national levels, on the one hand, and the local community on the other. These are the more highly differentiated members of the community, who have become at least somewhat a part of the national society. National integration thus proceeds from a "web of group relations which extends through intermediate levels from the community to the national level."² That is, nation-oriented groups are the vehicle or channel through which a national culture and ideology is transmitted to wider and heretofore isolated segments of the society.


The distinction Wolf makes between nation-oriented and community-oriented groups can be compared to Redfield's folk-urban dichotomy.³ The correctos of Tepotzlan, as defined by Redfield, are also nation-oriented and lead less traditional lives than the tontos, the inward-oriented, folk villagers.⁴ Seen in this light, the folk-urban dichotomy would not apply to whole communities, but to segments of the whole; that is, communities would not be classified as folk or urban, but as differing in their degree of

¹Ibid., p. 115.

²Eric Wolf, "Aspects of Group Relations in a Complex Society: Mexico," American Anthropologist, 58, 1956, p. 1065.

³Robert Redfield, "The Folk Society," American Journal of Sociology, 52 (4), 1947.

⁴Redfield, Tepotzlan: A Mexican Village, Chicago: University of Chicago Press, 1930.



folk or urban components. Thus, a peasant community like Tepotzlan would consist largely of a folk component with a small urban elite, while a metropolis like Mexico City would contain a small folk segment among its slum dwellers, who still follow a rather traditional way of life and are closely tied to their immediate locality.¹ Icken's study in San Juan has shown that many rural customs are preserved in the closely knit social life of the shanty town, where many of the families' relatives and closest friends live.² Thus, as Mintz has pointed out, folk culture is preserved in the form of a lower class subculture in which alternatives to this older way of life are not economically or socially feasible.³

The value of Wolf's approach lies in the fact that it focuses attention on relationships between groups operating on different levels of society rather than on the local community per se. Wolf has coined the term "broker" to refer to those persons who mediate between nation-oriented and community-oriented groups.⁴ As he points out, brokers are often marginal men seeking political and economic power in the society. Thus, in Mexican history the brokers were neither the Indians living in isolated, largely self-sufficient rural communities nor the large landowners or hacendados, who held effective economic and political power and blocked the channels of communication and control from the local to the national level. The brokers in Mexico were marginal, largely landless men who bought into Indian communities with the development of the concept of private property and developed their farm land

¹Oscar Lewis, The Children of Sanchez, New York: Random House, 1961.

²Helen Icken (Safa), From Shanty Town to Public Housing: A Comparison of Family Structure in Two Urban Neighborhoods in Puerto Rico, unpublished Ph.D. dissertation, Columbia University, 1962, pp. 122-129.

³Sidney Mintz, "On Redfield and Foster," American Anthropologist, 56 (1), 1954, p. 91.

⁴Wolf, op. cit., p. 1075.



for cash crop production through plow culture. Through the Mexican Revolution, and the land reform program, they succeeded in breaking the power of the hacendado and opening up channels of upward mobility, chiefly through the political party. The result has been a greatly increased power of the national government, which now has direct access to the peasants through the ejido program, and the creation of a new nation-oriented political elite to replace the old, community-oriented hacendados.¹

The Closed Corporate Community and the "Open" Community

Following Wolf's thesis, "brokers" form an essential link between the local community and the national society. With the development of a broker class, there is a shift among the rural peasantry from what Wolf has called the closed corporate community to the "open" community which is an integral part of the nation-state.²

The closed corporate community, as defined by Wolf, is characterized by a tightly-knit internal structure which attempts by various means to shut off influences from the outside world. Thus, the community restricts the sale of land to outsiders and in other ways tries to prevent outsiders from becoming members of the community (e.g. through marriage rules). The Westernized person is not looked up to as a model of modernity, but is ostracized as a deviant from the traditional way of life. The only involvement with the national economy is through intermittent day labor on haciendas and plantations, and through a regional marketing system which is particularly geared to the peasant's subsistence economy. Thus, little cash flows through the community, and what wealth there is, is never allowed to accumu-

¹Ibid., pp. 1067-73.

²Eric Wolf, "Types of Latin American Peasantry: A Preliminary Discussion," American Anthropologist, 57 (3), 1955.

. 90'

late, but is redistributed periodically through religious fiestas, the cofradia system, and mutual aid practices. In this way, pressure is brought to maintain everyone at the same, low socio-economic level or what Geertz has termed "shared poverty."¹ There are strong sanctions against conspicuous consumption, and superstition, witchcraft, envy, and gossip operate to maintain a close social control over community members.

In Latin America, the closed corporate community is generally concentrated among subsistence peasants in the highland area, but it can also be found in other world areas, and Wolf has compared Mesoamerican cases with examples from Central Java.² Wolf himself has stated that the closed corporate community is not limited to any culture area, but is the product of " . . . the dualization of society into a dominant entrepreneurial sector and a dominated sector of native peasants."³ This occurs most commonly under conditions of colonialism, where the foreign power acts as the "dominant entrepreneur" as was the case with the Spanish in Mexico and the Dutch in Java. However, the closed corporate community can also be found in non-colonial underdeveloped countries characterized by what economists have called a "dual" structure.⁴

The ideal model of the C. C. C. pictured above is now difficult to find. The closed corporate community is fast disappearing, under the pressure of modern conditions. Land scarcity is forcing the surplus population in these communities to seek other sources of income and many migrate to the cities in

¹Clifford Geertz, "Religious Belief and Economic Behavior in a Central Javanese Town," Economic Development and Culture Change, 4, 1956, p. 141.

²Eric Wolf, "Closed Corporate Peasant Communities in Mesoamerica and Central Java," Southwestern Journal of Anthropology, 13, 1957.

³Ibid., p. 8.

⁴J. H. Boeke, Economics and Economic Policy of Dual Societies: As Exemplified by Indonesia, New York, Institute of Pacific Relations, 1953.

91

search of job opportunities. These migrants constitute a new type of "broker," introducing new standards, tastes and values to the villagers left at home. This is particularly true where, as in Greece, urban migrants maintain frequent contact with their rural kin, despite changes in class position and ways of life.¹ Because of their long history of contact with an urban center and their early development of a sense of private property, Greek villages were probably never closed corporate communities in Wolf's sense of the term. However, under the influence of these migrants and other urban-educated elite living in the villages the peasants occupational and educational aspirations have taken a decided shift;² they now aspire to traditional professions in teaching, law, medicine and the priesthood, with emphasis on a humanistic education, but have not yet caught up with the new urban trend toward education in the physical and social sciences and engineering, and toward work in industry and commerce. "Lagging emulation," as Friedl calls this concept, thus "provides a mechanism of transition by which rural peasantries gradually become an occupational, non-peasant segment, fully integrated into a national culture and society."³ In short, lagging emulation becomes a means of hastening the attitudinal transformation of the peasantry so that they identify more closely with the new urban and national trends.

Icken's data show how older urban residents may also act as brokers for newly arrived migrants by easing their transition into the urban milieu. In the Puerto Rican shanty town, friends and relatives of the new migrants help them to find a home and a job, to locate urban facilities such as the school and hospital, and to establish new social contacts in the urban

¹Ernestine Friedl, "The Role of Kinship in the Transmission of National Culture to Rural Villages in Mainland Greece," American Anthropologist 61 (1), 1959, p. 31.

²Friedl, "Lagging Emulation in Post Peasant Societies," American Anthropologist 66 (3), Part I, pp. 572-574.

³Ibid., p. 570

92'

area.¹ In this way, older urban residents help to hasten the incorporation of newly arrived migrants into the urban centers of the society. The result is to level cultural differences, which might be maintained intact in the rural area, and to encourage the development of a new, national culture based on universally recognized values and standards. Seen in this light, migrants can be considered an important tool in the process of national integration, which those who deplore the rush to the cities in the underdeveloped areas might well take into account.²

Before going further it will be helpful to pull the strands of this argument together. Development at the national level involves the progressive differentiation of institutional structures along a series of single dimensions, and accompanying this process are the changes in behavior and ideology that participation in the new institutions requires. The institutional changes typically originate in urban areas and spread out to villages. The systematic sequential differentiation at the national level is paralleled at the local level. Similarly the institutional differentiation in the community is accompanied by the adoption by individual members of urban or national behavior, culture and ideology. In a sense we could say that behavior and value patterns become differentiated as well. Further, the rate of change of the articulation process appears to be progressive; that is, as communities increase their national institutional base and the members become part of a wider national consensus they become increasingly able to absorb new institutions and more of the national life style.

The connection between individual-level change and social structural change can perhaps be made clearer by pushing the argument a step further. Culture can be viewed, at a quite general level, as a system of shared

¹Icken (Safa), pp. 78-79.

²See also the analysis in Chapter 5.

meanings attached to social objects. These meanings arise from information concerning these objects communicated from one individual to another. A social system can thus be considered as an organization for the orderly processing of such information. Following this line of argument Frank Young has defined differentiation as "the capacity of a system to process diverse types of information."¹ The more differentiated an institutional system, the more information he can "process," that is, the more information he can understand and make use of. Innovations, whether at the institutional or individual level, can be viewed as new information. Thus, whether an individual or a community will accept an innovation, be it a new institution, a new behavior pattern or a new ideology, depends upon the present level of differentiation, the present ability to process information. This makes more understandable the empirical finding of the Youngs mentioned above, that highly differentiated communities accept more innovations than their less differentiated counterparts.

Planned development schemes also contribute to the differentiation of communities, both in terms of adding new institutions and in terms of accelerating the development of a more heterogeneous population. Since, as we have shown, development schemes tend to favor certain sectors of the society more than others, differential benefits also accrue to individuals or groups within the local community. For example, Berreman describes an Indian village where the community development program, because of its emphasis on increasing agricultural productivity, benefitted primarily the high caste Hindu farmers and neglected the untouchable artisan caste, who naturally felt excluded from the program.² Of course, any change presupposes a predisposition on the part of the peasant to adopt new methods and techniques, which Wolf tells us is

¹ Frank W. Young, Berkely A. Spencer and Jan L. Flora, "Social Differentiation and Solidarity in Peasant Communities" unpublished, mimeo, Cornell University.

² Gerald Berreman, "Caste and Community Development" Human Organization, Vol. 22, No. 1, 1963

94

not common in closed corporate communities. But the development schemes themselves may be conducive to a change in the peasants' attitudes by encouraging individual mobility and wealth accumulation. All Western development schemes are implicitly based on the Protestant ethic in their emphasis on individual initiative and personal gain at the expense of family and community ties.

In the "open" community, as Wolf describes it, individual accumulation of wealth is both permitted and expected. The open community lends itself to rapid shifts in production techniques and other developments because the adoption of new methods is a matter of individual initiative without any serious interference on the part of the community. The peasant can decide to send his son to high school, or to plant a new seed, without consulting his neighbors or obtaining their sanction. He is forced to be more outwardly oriented than the peasant in the closed community because he relies heavily on outside sources of credit to finance his production of cash crops. The risks attached to cash crop production often spell downward mobility for both the peasant and his creditor, so that the open community is characterized by a repeated "circulation of the elite" not found in the stable, subsistence economy of the closed corporate community.¹

With the shift from the closed corporate community to a more open type of community, there is a change in both the number and the nature of the broker relationships, since the open community is institutionally more differentiated and its members more heterogeneous. Peasants in closed corporate communities may be involved in collective, highly personal relationships with a person of wealth and influence, usually a large landowner, which often tend to maintain the stability and status quo of the subsistence community. By emphasizing the superior nature of the landlord as opposed to

¹Eric Wolf, "Types of Latin-American Peasantry," pp. 462-465.

as

the inferior nature of the peasants, status distinctions in the community are reinforced and individual mobility is discouraged. The peasant in the open community, however, is usually involved in a series of such relationships and is rarely dependent wholly on one person. Thus, the southern Italian peasant may have depended for centuries on the landlord to provide him with credit, seed, fertilizer and other needs, but as the government begins to move into these communities and new institutions take root, he establishes new forms of broker relationships with the policeman, the tax collector, the mayor, the political party representative and other public officials.¹ He also begins to participate in national-level institutions such as a school, a labor union, or a political party, and the representatives of these institutions initiate another new set of broker relationships.

The broker relationship established with a representative of national level institutions is of a radically different order from the old landlord-peasant relationship. Whereas the latter served to maintain the status quo in the community, the broker from the national level institution represents a mechanism for change in the local community. The peasant can use these brokers to improve his position in society and to represent his interests at the national level. Thus, institutions like the labor union or the political party may be forced to air his grievances and to bring pressure upon the government to recognize and meet his needs. The school offers him a chance to learn new skills and to leave his traditional way of life and seek new opportunities elsewhere. It is true that peasants may fail to take advantage of these opportunities or that national level institutions may also be used to keep the peasants in a subordinate position. In the case of Mexican peasants, for example, Wolf has argued that". . . the granting

¹Edward C. Banfield, The Moral Basis of a Backward Society, Chicago: The Free Press, 1958, pp. 69-82.

96

of ejidos tended to lend support to their accustomed way of life and reinforced their attachment to their traditional heritage."¹ However, the very fact of collective representation at the national level through the ejido program offers the possibility for change which did not exist previously; ejidatarios now constitute a potential political force in Mexico, which can be used by the government or other political groups. This recognition of his needs at the national level and their incorporation into government policy and programs is a sign that in Mexico, at least, the peasant is becoming a fully integrated member of society.

To summarize, then, the process of national integration signifies the loss of parochialism and social isolation of the local community and a growing importance of formal national institutions and a special class of brokers who mediate between these national level institutions and the local villagers. The shift from a closed corporate community to an open community is accompanied by:

- 1) a growing outward orientation on the part of the villagers, signified by the development of various kinds of "broker" relationships with persons in the outside world;
- 2) the increasing importance in the community of cash crops and other monetary institutions such as banking, credit associations, national trade, etc.;
- 3) changing standards and aspirations in such matters as occupation, education, prestige symbols, age and sex roles, and even attitudes toward time, consonant with the standards prevalent among the urban, nation-oriented elite;
- 4) an emphasis on status and upward mobility, demonstrated through conspicuous consumption and wealth accumulation;

¹Eric Wolf, "Aspects of Group Relations. . ." p. 1073.

97.

- 5) The growing differentiation of community members, which eventually leads to the development of a number of subcultures in the community besides the peasantry. The homogeneous, one-class peasant community is replaced by a heterogeneous, multi-class community composed not only of peasants, but artisans, shopkeepers, white-collar workers, professionals, etc. With time, the peasantry itself is transformed into an occupational category and is no longer a distinctive subculture with values and ways of life it can call its own.

Implications for Educational Development

We are now ready to turn to the implications of this analysis for development planning, particularly in the field of education. While we have dealt only briefly with education in the preceding theoretical discussion, the need for understanding these theories of community structure and change should become clear here.

Perhaps the easiest way to see the relevance of this analysis for educational development is to take actual examples of schools at the village level and examine their success or failure in the light of the theories presented here. Fortunately, Manning Nash has presented us with just such case studies in a recent article on the role of village schools in the process of economic and cultural modernization.¹ While we will use the data Nash has given us for background material, our analysis will be somewhat different because we will examine the data from the viewpoint of the theory presented above.

1. The Village of Amatenango

Nash contrasts village schools in Mexico, Guatemala and Burma. The village of Amatenango, Mexico, as Nash describes it, is a Mayan community of some several thousand persons, "a distinct local society, united by blood and custom, living on its own territory and conscious of itself as

¹Manning Nash, "The Role of Village Schools in the Process of Cultural and Economic Modernization," Social and Economic Studies, 14 (1), 1965.

98

an ethnic entity."¹ It has some contact with the national society, but this is minimal and frequently the result of direct government action. The efforts of the Instituto Nacional Indigenista have brought a school, a clinic, a store and credit society and piped water. Some of the inhabitants also have ejido land near the community. Although they participate in the regional market economy, the villagers have little interest in or direct contact with the outside world. Referring to the Youngs' scale of institutional differentiation, Amatenango seems to be in the second phase of institutional growth, "traditional or representative contact."

It is not surprising, then, that the school has little impact on the village. It is an agent of the outside world and transmits an entirely different cultural tradition, alien to the Amatenangeros. It transmits information which, at their present level of institutional and individual differentiation, they are unable to accept and make use of. About the only impact the school appears to have is in providing the men with a limited fluency in the national language, which is useful to them in their contacts with the outside world.

The school's isolation from the lives of the villagers of Amatenango is heightened by the alienation of the schoolteacher.² He has little to do with the village population and feels no identification with them. Consequently he cannot and does not act as a broker for the village; only a person with links to both the national and community level can serve in this role. It would seem that the only real brokers in this community are a few former graduates of a boarding school established by the Mexican government, all of whom have returned to reside in the village. These graduates now form

¹Ibid., p. 133.

²Ibid., p. 135.

99

somewhat of an elite in Amatenango, and hold top offices in the cofradia, the village's self-governing civil-religious hierarchy.¹

Nash cites the successful example of these boarding school graduates as proof that education in this type of closed community must be "withdrawn from community constraints" to have any effect on the villagers.² That is, as long as the school operates within the community setting, students are not free to open their minds to a new and different cultural tradition and they must therefore be physically removed from the village for education to have any impact.

So drastic and costly a solution would obviously be unacceptable to most educational planners -- as well as most villagers. They would not want their children taken away to school at an early age, and be deprived of their help at home and in the fields. To establish boarding schools on the elementary school level would clearly be very costly because of the mass of children involved, and to limit this to a select segment of the elementary school population would only reinforce the elite base of the society. It would seem that only at the secondary school level might boarding schools become a feasible alternative, since the number of students involved is usually much smaller and they often require specialized or technical training which can be given most efficiently and economically in centralized boarding school setups.

If boarding schools are not a viable alternative, what then can be done for the elementary school children of a community like Amatenango? Perhaps closer attention could be paid to the curriculum so that it bore more relationship to village life. More emphasis could be given to Mayan heritage and custom, and to sports and other recreational activities in which village children traditionally participate. The school could become a center of village life by serving as a meeting place for the cofradia and other traditional

¹Ibid.

²Ibid., p. 136.

100

village activities and by participating in village fiestas such as the feast of the patron saint. This is most definitely not an argument for a special form of rural education, such as "basic education," "fundamental education," or "community education," for the establishment of separate curricula for ethnic or regional groups is likely to intensify cultural differences at the expense of national integration in that it provides an avenue for intellectualizing and rationalizing the importance of primary group loyalties over and above national loyalty. It is nevertheless possible to make use of the local culture in choosing instructional examples and illustrations and to take cognizance of local ceremonies and important events, all within the framework of the national curriculum. The school, by first capturing the attention of the villagers through attention to local tradition, can then introduce them to a new and somewhat alien way of life. ^{this the} In regard, ^{the} personality of the schoolteacher and his rapport with the villagers is, of course, very important.

Amatenango already shows several signs of change. The fact that the boarding school graduates are looked up to as leaders in the community is evidence that the value of education is to some extent recognized and respected. If this were a completely closed community, these persons would be treated as deviants. It is also important that they have remained enough a part of village life, despite their superior education, to act as mediators between the villagers and the outside world. As more villagers recognize the prestige attached to this broker role, and the benefits to be gained from knowing how to deal with the outside world, the perceived value of education may increase. The school will be able to assume its full role in drawing students into the national framework, however, only when the village reaches a higher level of institutional and individual differentiation.

101

2. The Village of Cantel

The second community Nash describes is located in the highlands of Guatemala and is, by Wolf's description, a far more "open" type of community than Amatenango. Compared to the latter, the village of Cantel is more populous, contains several subcultures besides the peasantry, particularly an important artisan class, and bilingualism is far more widespread. Above all Cantel is the site of a relatively large factory, which has opened new job opportunities to the villagers and provided them with new links to the outside world.¹ Institutionally it is much more differentiated.

One index of the "openness" of Cantel is to be found in the occupational aspirations of its school children. As Nash points out, their marked preference for artisan and specialist occupations shows a decided break with traditional community roles and ties.² Since most of these occupations could not be exercised within Cantel, the children, in choosing them, have indicated their willingness to risk their futures in the outside world. In Young's terms, they are capable of processing more information; certainly much more than the older generation of Cantel, who were less willing to undertake new occupational roles, which would involve leaving the village and learning new skills. The older generation were hesitant to risk their investment in village life for an unknown return in the outside world. As Nash explains:³

"In local communities, the village school begins to instill different values from those of the local community, but adulthood, the claims of mundane life, the competition of the known with the unknown, and the absence of supporting institutions beyond the schools (italics supplied) makes these values, in most instances, atrophy and disappear."

Nash has here recognized a very important implication for educational policy makers and planners; namely, the need for institutions besides the

¹Ibid.

²Ibid., p. 137.

³Ibid., p. 138.

school to reinforce the values transmitted through the educational system. Peasants must see the utility of education in terms of new job opportunities, in terms of the ability to read a local newspaper or understand an official document, or in terms of growing a better crop or selling more products at the market. They must participate in other institutions which instill a national ideology, such as the army, political parties, labor unions, land reform and other development programs. Education alone rarely if ever can "open up" a community; it is only one part of the larger processes of differentiation and articulation; it must be part of a holistic program which includes the improvement of trade, transportation, communication, and other mechanisms which link the local community to the outside world.

Nash also cites the lack of government support as another reason for the failure of the schools in Cantel to act as major catalysts of change in the community.¹ Here he refers not only to the lack of financial support, in the form of textbooks, teachers' salaries, school buildings, etc., but also to the lack of a clearly defined governmental policy for the incorporation of Indian communities into the national state. While the government would like the electoral support of these Indians, it fears that the growing political consciousness of this submerged majority may be turned against it and used as a potential force to bring about major changes in the political and social structure of the society. Thus, as Nash points out:²

"The schools are not seen nor used as catalysts in social change, but are confined to transmission of the elementary skills, some patriotism, and some minor facts about history and geography."

In most underdeveloped countries, the politicalization of a submerged sector of the population poses a major threat to the existing power structure of the society. Effective political power is, in most cases, still concen-

¹Ibid., p. 137.

²Ibid.

trated in a small elite group, afraid of losing its historic privileged position. Yet national integration cannot be truly achieved without broadening the base of political support. As Deutsch has pointed out, the process of "social mobilization" brings with it an expansion of political participation and increased demands for government services and expenditure.¹ Thus the government must choose between safeguarding the rights of a privileged minority and broadening the base of its political support to incorporate all segments of the society within the national political consensus.

If the government succeeds in winning the support of this new electorate, it can greatly strengthen its own political position. It can establish direct links with this rural population and thus subvert the power of the old urban elite. But to do so, the government must embark upon a bold new program involving a radical change in public policy and a rapid extension of government services. It must institute programs of tax reform, land reform, and welfare services, and it must modernize its educational system so as to serve the needs of this new electorate. By extending education and other services to this heretofore neglected population, the government can reach a much wider population than the small urban elite upon whom it traditionally depended for support. The school, like the political party, may serve as an agency of indoctrination for the national government, imbuing the students with its political aims and values and teaching allegiance to the national state.

However, if the government chooses to ignore the demands of this potential political force and to confine itself to a traditional elite base of political support, the school may serve essentially as a mechanism for maintaining the status quo in the society. As in Guatemala, it will concentrate on traditional curriculum and teaching methods and fail to prepare its students for new tasks in the outside world. It will not extend

¹Karl W. Deutsch, "Social Mobilization and Political Development," in American Political Science Review, 55 (3), 1961, pp. 498-502.

the horizons of the students beyond the confines of the local community by emphasizing the history of that society and its place in the modern world. Thus, only if the government adopts a conscious program aimed at the incorporation of all peoples into the national political framework, and sees education as an instrument of that policy, can the school serve as a nation-building institution.

3. Two Burmese Villages

The effects of village schools in two Burmese villages provide an instructive contrast with Amatenango and Cantel. The situation of the Burmese village studied by Nash is markedly different from that of the two just considered:

Unlike Meso-America, the villages and communities of Upper Burma are not distinct cultural entities, rather they are variations on a common regional culture, located expressions of cultural organization of a tradition deep and widespread in the region. Further, villages do not have the restrictive, bounded social corporateness of Meso-American Indians. These villagers are inhabitants of a country known to them, the rural extension of Burmese society and culture.¹

These villages then are already well articulated with the traditional national culture. The government has set itself the task, at least on paper, of promoting the establishment of a modern socialist welfare state, which will require a much greater degree of institutional differentiation at both the national and the village level and the development of a new consensus. Thus the goal is the articulation of the villages with the new national institutional framework and ideology. The problem then is different from that faced in Meso-America, where local communities have only recently begun to be incorporated into the national framework, traditional or modern.

The first of these two Burmese villages described by Nash is identified only as a "mixed-crop village."² It is relatively much wealthier than a

¹Ibid., p. 139.

²Ibid.

village such as Amatenango, has two schools, both a government school and a traditional monastic school, and virtually all the children who are eligible are enrolled in one or the other. In spite of this high attendance rate, however, these schools do not serve to articulate the village with the modern sector of the nation, and, as presently constituted, do not appear likely to. '

Both village schools are an integral part of the traditional culture. Buddhism has traditionally placed high value on literacy and for centuries monks have taught a minimal amount of reading and writing to the peasantry. The teacher, in traditional Buddhist belief, is one of the five great objects of honor. He is the repository of a fixed body of traditional knowledge. The teachers in this village fulfill this role-expectation. Students are expected to acquire knowledge letter-perfect; feats of memory, long recitations and knowledge of standard answers to standard questions are rewarded. Teaching is a very much a rote affair. Students are not expected to innovate, nor to challenge or question either the teacher or the body of knowledge. These schools are thus agencies for the transmission of the traditional culture. They are "not detached from other educative agencies of the community" but are "only an extension of a local society teaching its young to be members."¹

That the schools are only one of a variety of traditional socializing agents is reflected in the attitudes of the villagers toward them. Although education in the abstract is valued, little actual support is given, and even that is conditional upon the schools fulfilling traditional expectations. Thus attendance is irregular, as almost any household or religious task is considered more important, and girls receive less education than boys.² These schools are most definitely not modern institutions. Even

¹Ibid., pp. 140-41.

²Ibid., pp. 141.

though one of them is supported by the government they are in no sense parts of the new national institutional system. And, indeed the little support given by the villagers appears to be conditional upon their remaining outside the new system.

The monks in the religious school are clearly not brokers for the new institutional system, their job being to transmit and reinforce the traditional culture. The teachers in the government school might be able to serve as brokers but the village is not ready to accept them in this role. As in Cantel, lack of government support complicates the problems of these teachers. Not only are they poorly compensated for living a life almost of exile, but they are at the bottom of a complex educational bureaucracy which is more responsive to political currents than to their demands.

Nash finally describes a Burmese village which makes its living by wet rice farming. Here a single school, with a single teacher, plays precisely the same role as those in the mixed crop village. The only important difference between the two villages is that this one is very poor; its inhabitants have difficulty living even in the modest style of the Burmese peasant.¹ This poverty is reflected in low school enrollment, and sporadic attendance. In relation to this, Nash makes a crucial point:²

There is a prevalent belief that money and means would solve all the ills of local education. What increased investment would do, in the absence of social and cultural change, is merely to shift schools like the one in the rice village toward the full achievement of the Burmese pattern as exemplified in the mixed crop(village).

So we return once again to the most important implication of the theory presented in the early portion of this chapter. The school is able to do little in isolation from other national institutions. Its ability to serve as an articulating agent between the village and the nation is dependent upon

¹Ibid., p. 142.

²Ibid.

107.

the level of differentiation, both institutional and individual, in the community it is to serve, and upon the will of the national government to use education as a nation-building instrument.

SUMMARY AND CONCLUSION

The theoretical substance of this paper represents a synthesis of several conceptions of the community-nation articulation process. We have attempted to apply these theoretical concepts to an understanding of the role of education in the process of national integration. We have stressed the role of education in inculcating a national ideology in its students by teaching them about the nation's history and heroes and by extolling the aims and plans of the present political regime. The school serves also to prepare students to participate in this new political order by equipping them to work as civil servants, politicians, labor union leaders or in other bureaucratic posts. Above all, the school subjects all students to a common set of cultural norms and values.

By way of summary, it may be worthwhile to repeat here some of the principles which educational planners should keep in mind as they attempt to use education as a nation-building institution in these newly emerging states. Four principles appear as the most important:

1. The distinction between closed and open communities.

It should be evident from our discussion that education will have a very different impact in closed and open communities. The open community, being more differentiated at both the individual and the institutional level, is likely to be more receptive to education, viewing it as a means of upward mobility and as a means of learning more about the larger society. Therefore, an initial educational development scheme in an underdeveloped

1082

area might well start with such communities, since the possibilities of success are much greater than in closed communities.

The closed corporate community represents a far more difficult challenge to educational planners. There are those who argue that the best way to deal with these insulated communities is to assault them with the most modern techniques and innovations, that the very contrast with their traditional way of life will be more appealing than a gradual, evolutionary change.

Others maintain that it is important in a program of planned educational change to demonstrate respect for local traditions, to build upon the people's knowledge of their own local customs and institutions and to show them the similarity between their beliefs and practices and those in the larger society. Thus, in order to adopt a more universalistic set of values, the closed community need not break completely with past tradition, but must widen its sphere of reference to include larger and more inclusive groups in the society. As Geertz has pointed out: "The integrative revolution does not do away with ethnocentrism; it merely modernizes it."¹

But the virtue of a gradual, evolutionary approach in a program of planned educational change versus a radical, massive transformation is a tactical argument to be settled through practice and experimentation. The important point to recognize here is the differential role of education in open and closed communities, and the necessity of assessing and taking into account the local level of differentiation.

2. The importance of the broker role

A second principle which emerges as very important to educational planners is the significance of the broker in the process of articulating village communities to the national society. In particular, educators should recognize the ways in which the school can promote the development of

¹Geertz, p. 154.

109

a broker class in the local community. The schoolteacher himself serves as one of the most important brokers in relating the community to the larger society. He is an agent of a national institution, and he is usually an outsider who was born and educated in a different area of the country, and thus embodies a somewhat alien cultural tradition; but at the same time he is, by virtue of his superior education and official position, almost automatically a member of the local elite and as such, his attitudes and way of life may be looked up to by the local villagers as a model for their own behavior.¹ Thus, the personality of the schoolteacher and his rapport with the villagers are crucial factors in determining the success of planned educational change in local communities.

Students, too, come to form part of the elite of these communities, and thus become the leaders who direct the pattern of change along certain lines. Graduates of secondary schools and other forms of higher education are often forced to leave the local community in order to occupy new positions in the larger society; but if they continue to maintain close contact with their home community they help to relate this larger world to their former fellow villagers. Even if they remain in the community, the new concepts they have learned in school and the new social contacts they have made serve to establish new links between the local community and the outside world.

Education has been blamed for contributing to the exodus from the rural areas to the cities because migrants are often impelled to test their newly acquired skills in the urban area, which offers greater and more diverse job opportunities than the small rural community. In addition, education, simply by teaching students about the outside world, makes them anxious to see and know more about it. While this charge is probably correct, it is

¹See Friedl, op. cit., p. 579.

110

also true that educated migrants come to the city more prepared to withstand the demands of a new urban way of life than those who arrive with no skills and no knowledge of how the larger society operates. The formers' adaptation is easier, and therefore less troublesome to the authorities who must provide these migrants with services and other forms of aid. At the same time, as we have seen, these migrants can provide new links between the urban and rural sectors of the society, and introduce new beliefs and practices to their hometown community. The importance of migrants in promoting the process of national integration should not be overlooked.

3. The need for supporting institutions besides the school.

This principle has been fully explained previously. We wish merely to emphasize here the need for education to be part of a comprehensive development plan, even on the village level. It is totally unrealistic to set up a new school in a community and expect it alone to alter the villagers' way of life and outlook. Under these circumstances, the school either has no impact on the local populace, or it too loses touch with the mainstream of national culture and becomes merely a mechanism for perpetuating the status quo in the community.

Education, to be effective, must be linked into other institutions which give it meaning and value. If the school is to prepare students for new roles in the national society, there must be possibilities for these students to participate in that society through job opportunities, political posts, the administrative structure, etc. Villagers must become aware of the outside world through various media besides the schools such as the political party, labor union, agricultural cooperatives, etc. Only through participation in a number of national-level institutions can villagers become fully integrated into the life of the national society.

WV

4. The importance of government support.

An effective policy of national integration rests heavily on government support. As Adams has pointed out, the impetus for the development and integration of local communities must come from the national level. It is the government that provides the techniques, implements, credits, and education on which development is based. Therefore, development on the community level presupposes some degree of development on the national level.¹

Moreover, there are many alternative ways of becoming "educated," particularly for those who are beyond formal school age. Migration can be interpreted as a mechanism whereby people are exposed to multiple perspectives and thus get educated. Similarly, visiting the city, or having relatives there, or being in a community that is a stopping point for outside traffic or other communications, can all be viewed as educative mechanisms. Political activities and religious organizations, particularly small sect movements such as the pentecostals, may also educate. Another example is the kind of education that goes on in small shops and factories. In communities such as the Burmese villages described by Nash, where the schools and teachers are part of the traditional system, it might be wise to concentrate first on trying to harness the educative potential of these sorts of institutions. And even in communities where the school is a modern institution it would be foolish not to try to use other institutions to accomplish as much of the educational job as possible. In short, the school must be viewed as one of many institutions, which should all be harnessed together if each is to make its optimal contribution to the process of national integration.

It is clear that communities cannot develop in isolation from the national society, for development implies closer articulation of the local community with the national society, through which villagers gain access to markets,

¹ Adams, pp. 5-9.

1/2

systems of transportation and communication, educational facilities, etc. But community development is not a simple funneling down process from the national level, as Adams would seem to suggest. Some "grass roots" development must take place for the community to be integrated into the national society. On the political level, for example, it is mainly through participation in local self-government that villagers begin to participate in the national political structure. Thus, the cause of national integration may actually be served by strengthening the local autonomy of village communities rather than by concentrating all power in the hands of the central government. Similarly, the dependence on outside sources for credit, markets, implements, and techniques increases as the community turns from subsistence farming to cash crop production. It is true that the government may supply and coordinate these needs, but it does so in response to a demand emanating from the local communities.

Seen in this light, national development is a two-way process, whereby communities develop through closer articulation with the national society, and the national government increases its power as it establishes direct contact and control over a wider range of local communities. It would be a mistake to limit development to either the local or national level. For just as communities cannot develop in isolation from the national society, so the national government which cannot reach the local community is doomed to failure in its development plans. Development should therefore concentrate on programs which build up links between the national and local levels. And as we have seen, this is a process in which education can play a vital role.

CHAPTER 4

POPULATION AND EDUCATION

The structure, size and growth of a society's population obviously affects education. If population is expanding more rapidly than educational facilities and personnel, then the enrollment ratios, literacy rates, median school years completed, and other measures of educational attainment will tend to fall. If a population is stable, any increase in educational facilities and personnel will tend to raise levels of educational attainment in the society. All that this implies, of course, is that for educational development to occur, educational facilities and personnel must expand more rapidly than the school-age population. As an exception it is possible that increased efficiency in the use of existing resources may promote educational development even if the growth rate of educational facilities and personnel is somewhat lower than the growth rate of school-age population.

The resources which a society devotes to increasing its educational output will, of course, not be available for other uses (assuming that the society is utilizing its resources fully). There may be some countries with such rapidly growing school-age populations that even a very high concentration of resources on educational expansion may still not allow a rate of educational expansion which will engender much educational development. On the other hand, there are societies where, if only a small proportion of the society's scarce resources is devoted to educational expansion, a rapid rate of educational development may be forthcoming.

For some countries the achievement of universal primary education would be an accomplishment of formidable magnitude. For example, the

problem of finding the resources to educate 113,000,000 primary school children in India by 1981 is extremely sobering, especially in light of the fact that India's per capita product at that date is very likely to be only about one-thirtieth that of the wealthier western countries. Pakistan will have to expand its primary educational facilities by some eight times to reach the 100 percent goal by 1981.¹ When a wealthy country such as the U. S. only increased its educational expenditures by four times between 1945 and 1960,² it seems that there may be, of necessity, certain priorities which will prevent by the target date achievement of universal primary education in nations such as India and Pakistan.

These societies, like all others, must decide if their limited resources should go to meet these educational targets and if so, how much to various levels, how much to buildings and equipment, and how much to personnel. It also must decide whether it will favor one kind of education (e.g. technical) over competing types (e.g. humanistic).

Is there a general rule for rationally deciding such questions? Economists argue that rationality is best served if one type of resource allocation is carried to the point where the gains to be derived from this allocation are equal to the gains to be made from all other competing patterns of allocations. Thus, as long as gains to be made from allocating resources to education are greater than gains to be made elsewhere, further diversion of resources to education is rational, but when gains from

¹J. Miner and E. S. Solomon, "Implications of Population Trends for First-Level Educational Programmes," United Nations, Asian Population Conference, New Delhi, India, December, 1963.

²U. S. Bureau of the Census, Statistical Abstract of the United States: 1963, Eighty-Fourth Edition, Washington, D.C., 1963, p. 351, p. 113.

educational allocation are less than gains in other areas, educational allocations should be reduced. As a principle of action this is a sensible approach, but there is one very great problem. How does one measure "gains"? If the "gain" to be realized is a short-term increase in the total product in a society, then one set of allocation decisions may be rational, but, if the gain which is of major concern is a somewhat longer-term increase in per capita product, then another set of decisions may be better. This distinction would be particularly striking if educational expansion were thought to be clearly associated with lowered fertility, thus making necessary less allocation in some future time on population per se. Also, if the pattern of allocation affected evolving institutional arrangements in a manner which made more, rather than less, future productive investment likely, then "gains" might be considered in a different light. In the words of Leibenstein, "an appropriate investment policy must take into account not only the magnitude of the net output stream . . . but also what happens to that output stream."¹

The same line of reasoning would apply to decisions made within the area of educational allocation once the amount of that general allocation was determined. Would an emphasis on elementary schooling engender the greatest gains or would secondary schooling? Or college? Would greater increases in plant or in personnel be more profitable? What about the gains to be realized from sex education in schools or adult contraception control educational efforts?

If one ignores the possible differential effect of various patterns of allocation on future population growth and also on future institutional

¹Harvey Leibenstein, Economic Backwardness and Economic Growth, New York: Wiley, 1963, p. 266.

116

arrangements, it is a relatively simple matter to work out an educational plan which is adjusted to short-term projections of population growth -- such projections based on demographic data from the immediate past. The educational plan can proceed on the assumption that manpower needs will relate to future target figures for GNP in a way which can be predicted from the relationships which have held in the immediate past. Table 1 presents some hypothetical data which illustrate this method.

Table 1

EDUCATIONAL STRUCTURE OF AN HYPOTHETICAL LABOR FORCE
IN THE PRESENT, THE PAST, AND IN THE PROJECTED FUTURE*

Educational level of labor force	10 years ago (000)	5 years ago (000)	Present year (000)	Target 5 years hence (000)	Target 10 years hence (000)
No school	523	537	580	607	636
One to six years	580	686	781	909	1220
Six to twelve years	75	103	149	218	469
Twelve years or more	11	15	22	30	61
Total labor force	1189	1341	1532	1764	2049
Gross National Product in constant dollars (in billions)	7969	10690	13932	18822	25428

*Source: Hector Correa, "Educational Planning: Its Quantitative Aspects and Its Integration," Paris: International Institute for Educational Planning, Unpublished working draft, August 27, 1965, Chapter VII.

Target year figures for the educational achievement of the labor force are arrived at by projecting into the future the trends established in the ten years preceding. Instead of using productivity figures (product per man), the inverse of this (man per product) is calculated for each

education level ten years ago and five years ago. Then the rate of change in this inverse productivity for each educational level is derived. The general target figure for production in target years 5 and 10 are known, as are over-all labor force projections. All that is necessary is to arrive at the projections of the educational components of the labor force by assuming that the trend in the inverse productivities of the educational groups in the labor force (known for 10 years) will be continued into the future. Then the relationships between educational levels in the target years labor force becomes determined. When one knows the desired educational attainments in the labor force five and ten years hence, it simply is a matter of expanding the educational sectors for those now coming into the relevant school ages, by an amount which will insure that the labor force in five years and in ten years will have the required amount of schooling.

Manpower projections may give to those concerned with educational planning some quantitative guidelines to follow, and it will assuredly make them more aware of total population growth and of changes in the structure of population. All this is likely to make the general process of adjusting educational plant and personnel to population a somewhat more rational process. But such projections really do not tell those in a position to influence decisions whether a lesser or greater effort to educate particular age groups or all age groups would have engendered greater or lesser benefits in regard to long term economic per capita growth.

While many of the effects of population change on education are rather obvious the reverse is less so. What effect has education on the size of a society's population? Or, to break the question down, what

effect does education have on the number of live births, the number of deaths and the amount of migration into and out of the society?

The Effect of Education on Fertility

It has long been a commonplace to assume that increasing amounts of education tend to reduce fertility among those groups which are its beneficiaries. Many, but by no means all, empirical studies of the relationship between educational levels achieved and fertility seem to bear out this assumption. A survey of some of the available data on the subject might well be divided into three areas of concern: 1) differential fertility by education levels among various nations; 2) differential fertility by education levels among and within various regions within countries; and 3) differential fertility by education levels within particular societies -- by sub-groups (other than regional) or within the whole society.

Differential fertility by educational achievement among various nations. According to the available data, it appears that those countries which are able to school the great majority of their people are also the countries with the lowest birth rates. Using literacy rates as a measure, it seems that virtually all nations of the world which have achieved literacy rates of 85 percent or above now have birth rates below 25 (with a median of 18.7), while all those nations (on which any fertility data are available) with literacy rates below 40 percent have birth rates above 40 (with an approximate median of 44-48).¹

¹Data for these calculations were taken from Bruce M. Russett, et al, World Handbook of Political and Social Indicators, New Haven: Yale University Press, 1964, pp. 222-224 (for literacy rates); and Population Reference Bureau, Population Information for 129 Countries, Washington, D.C.: 1964, Data Sheet (for birth rates). All birth rate figures are for the latest available year and in no case from before circa 1960. It is a reasonable assumption that all birth rates not listed for the low literacy countries are above 40.

119

Of course, the countries with a high proportion of their population literate are characterized by a number of other attributes which contribute to their relatively low birth rates: higher per capita production, more urbanization, and a more advanced level of education. The higher level of education is even more strikingly evident on such measures as percent of population aged 15-19 and 20-24 in school.

In order to take some account of factors other than basic literacy, data presented by Harbison and Myers were used.¹ Using a composite index which includes both secondary and higher education enrollment ratios, Harbison and Myers placed 75 countries in four levels of educational development. Data on GNP per capita and percent in agriculture were also given for these countries. To relate population to the various levels of educational development, birth rates, total population, and annual rate of population increase since 1958 were added to the Harbison and Myers data.

Birth rates per 1000 population in Level I countries are high (mean = 45-52) and do not fall significantly when general educational development reaches Level II accomplishment (mean = 44-48). Furthermore, the range of birth rates is narrow at both levels. There is some decline in the mean or median birth rate (31 and 32 respectively) when the educational development reaches Level III and among these Level III countries there is great variability of birth rates (range 13.1-49.9). Finally in Level IV countries the mean and median birth rate drops to 20 and the range of variation is much smaller. Until Level III is reached there are no countries with low birth rates. The Level III countries with low birth

¹Frederick Harbison and Charles A. Myers, Education, Manpower, and Economic Development, New York: McGraw-Hill, 1964, pp. 23-48. For a fuller description, and evaluation, of this work see chapter 7.

rates are in Eastern or Southern Europe; the high birth rate Level III countries are in Latin America or East or South Asia. The Level IV countries are in Europe or European settled areas plus Japan.

Among the 21 Level III countries are five European countries which have over 45 percent of their populations in agriculture but which have birth rates under 25 (Poland, Yugoslavia, Hungary, Portugal, and Spain), and three Latin American countries with less than 45 percent of their populations in agriculture but with birth rates over 30 (Venezuela, Chile, Cuba). In order to see what happens to birth rates in those countries in the Harbison and Myers data where educational advance has been either relatively more or relatively less rapid than urbanization, the 17 countries which seem most characterized by these trends were considered separately.

Countries which have become educationally developed to a degree significantly in excess of their relative urbanization have lower birth rates than countries which have urbanized relatively more than they have developed their education. However, nearly all the countries in the former category are European and nearly all the countries in the latter category are Latin American. It could be that qualitative aspects of the cultural dissimilarities between Europe and Latin America are more significant factors in the differing fertility of these two sets of countries than are differences in educational development.

A similar question arises concerning the possible effects on fertility when countries advance relatively more rapidly economically (as measured by GNP per capita) than educationally and vice versa. For example, birth rates are substantially lower in those countries which are relatively more advanced educationally than economically as opposed to those countries

where the reverse is true. This pattern, further, did not appear to be influenced by geo-cultural area.¹

This data suggest that at certain stages, educational advance may be more birth depressing than economic advance. Of course, there is rarely a long-lasting gap between education and economic levels. However, if a lag in one type of development is to occur in a country, it is possible that at some stages a lag in economic output may be the lesser evil. For permanent and steady development it may be that the barrier of high fertility is the most difficult to overcome, and the type of social development most likely to overcome it may be more worthwhile than any other in the long run. As Leibenstein says:²

One cannot argue . . . that [since], on the basis of historical evidence, fertility decline is a consequence of economic development, we need not worry about birth rates. The reason why this approach is fallacious is that the economy might not have experienced sustained development if fertility rates had not declined at some crucial stage during this experience. One need not impute the absence of a barrier simply because the race is of such a nature that the barrier cannot be seen when it is successfully overcome.

If economic development typically cannot sustain itself without fertility decline at some point, it may be that those countries which, from the beginning, can combine per capita production gains with equal or even more rapid educational gains are most likely to ensure the required decline in fertility at some stage.

¹Harbison and Myers, op. cit., pp. 23-48; and Population Reference Bureau, Population Information for 129 Countries, op. cit.

²Harvey Leibenstein, Economic Backwardness and Economic Growth, op. cit., pp. 168-69.

Data dealing with educational and fertility measures for twenty Latin American countries were used to test further the relationship between these measures cross-nationally. Correlations between measures of fertility and education are presented in Table 2.

Table 2
CORRELATION BETWEEN EDUCATIONAL VARIABLES AND FERTILITY,
20 LATIN AMERICAN COUNTRIES, AROUND 1950*

	Percent illiterate	Percent 5-14 in primary	Percent 5-14 secondary	Mean years	Post- primary ratio
Child-woman ratio	.33	-.31	-.41	-.29	-.18
Crude birth rate	.61	-.62	-.70	-.51	-.31
General fertility rate	.51	-.52	-.63	-.46	-.30
Total fertility rate	.48	-.48	-.60	-.40	-.27

*Source: Unpublished material supplied by Professor J. Mayone Stycos, Director of the International Population Program, Cornell University.

The highest correlations were between general and total fertility rates and the crude birth rate as related to measures of current educational achievements (enrollment ratios and literacy rates) rather than past educational achievements (mean school years completed and the percent of total population with post primary education). This result implied that other factors related both to fertility and educational development were operative. The most obvious was urbanization. When urbanization was correlated with crude birth rates and illiteracy the results were $-.80$ and $-.77$ respectively. The partial correlation of illiteracy and the birth rate (simple correlation $.61$) drops to $.03$ when urbanization is controlled, and that between urbanization and the birth rate declines only from $-.80$ to $-.65$ when illiteracy is controlled. This is strong evidence, at least in Latin America, that international

fertility differences are tied more closely to urbanization than to education per se. However, if similar comparisons in other parts of the world were made, such a result would not necessarily be forthcoming. Visual observation of a graph of birth rates, percent urban, literacy, and enrollment ratios among 16 European countries indicated that correlations were very low whether percent urban - birth rate or educational measures - birth rate were considered.

Apparently educational development in the near future in the countries of the world with low enrollment ratios and literacy is not likely to have much influence on fertility. Only when nations have come rather far in educational development do further advances in education seem to be associated with reduced fertility. Educational development of the magnitude that would quickly push them into advanced Level III or Level IV positions (using the Harbison and Myers index) cannot be reasonably projected for countries still at a Level I or II position. In countries already having Level III status in educational development, further educational advance is likely to have significant effects on the fertility levels of those countries where birth rates are still high. Further, if general educational development in the least developed countries -- most of the Level I and II countries -- is not likely to affect fertility, the disturbing possibility arises that unless some more direct manner of depressing fertility can be found, many of these countries may never be anything but underdeveloped. Without fertility decline at some point per capita gains in any section may be halted and reversed.

Differential fertility by education levels among and within various regions within countries. The relation of education to differential fertility can be looked at from two regional points of view: (a) the degree

124

to which general fertility differences among regions are to be associated with differences in average educational achievement in the whole population of the various regions; and (b) the degree to which regions differ as to the relation of education to differential fertility within them.

An extensive study of regional differences (by political sub-units) within eleven Latin American countries has been recently completed.¹ It was discovered that the percent literate in the various regions of the particular countries had a relatively high negative correlation with the fertility ratio (number of children 0-4 years of age per 100 women aged 15-49) in Nicaragua, Guatemala, Costa Rica, Colombia, Chile, and Argentina. In Honduras, Mexico, Panama, and Venezuela there was a slight negative correlation, and in Bolivia, a positive correlation. Generally lower fertility in the better educated regions would be expected; however, when partial correlations were computed with percent urban in the regions held constant, it turned out that the high negative correlations in Guatemala and Nicaragua were changed to slight positive correlations, and that there was some reduction in the negative correlations in Costa Rica and Colombia and a sharper reduction in Chile. Correlations were computed between percent literate and the child-woman ratio among the regions in each country with a high percent urban and the regions in each country with a low percent urban. High negative correlations were found among urban regions in Argentina, Chile, and Guatemala and moderately high negative correlations in Mexico, Costa Rica, and Venezuela; there was a low negative correlation in Nicaragua, but low positive correlations were noted in Panama and Honduras.

¹This unpublished material has been made available by J. Mayone Stycos, Director of the International Population Program, Cornell University.

High or moderately high negative correlations were found among less urban regions in Argentina, Honduras, Chile, Costa Rica, and Panama, but moderately high positive correlations were found in Venezuela, Nicaragua, Mexico, and Guatemala. High positive correlations among both urban and rural regions were found in Bolivia. Table 3 presents these correlations.

Table 3
INTERCORRELATIONS OF LITERACY, CHILD-WOMAN RATIOS
AND URBANIZATION FOR THE POLITICAL SUB-UNITS
OF 11 LATIN AMERICAN COUNTRIES, AROUND 1950*

<u>Correlation of percent literate with:</u>						
	Fertility ratio (child- woman)	Percent urban	Child-woman ratio hold- ing percent urban constant	Child-woman ratio in areas with high percent urban	Child-woman ratio in areas with low percent urban	No. of units
Argentina	-.74	.27	-.74	-.71	-.77	24
Bolivia	.50	.32	.40	.84	.83	9
Chile	-.78	.85	-.46	-.81	-.55	25
Colombia	-.36	.34	-.31	-	-	-
Costa Rica	-.60	.33	-.55	-.59	-.52	65
Guatemala	-.46	.68	.03	-.77	.29	22
Honduras	-.16	.66	-.06	.29	-.73	16
Mexico	-.20	.63	.28	-.47	.39	32
Nicaragua	-.60	.99	.16	-.29	.58	17
Panama	-.10	.65	.27	.27	-.46	64
Venezuela	-.25	.88	.21	-.41	.49	23

*Source: Unpublished material provided by J. Mayone Stycos, Director, International Population Program, Cornell University.

The high negative correlations between literacy and fertility which existed in Argentina among both urban and rural regions may indicate that in countries such as Argentina, which are quite well developed both educationally and economically, one might generally find such relationships.

126

But in Bolivia, which is very underdeveloped both educationally and economically, there was a complete absence of such inverse relationship and, in fact, positive correlations were found. An observation might be hazarded that, as the process of educational development advances, the likelihood of inverse relationships, on a regional basis, between educational indicators and fertility increases. However, when educational development reaches a very high point (as in the U. S.), regional relationships between education and fertility probably become less significant.

Another question relating to regional differences concerns the pattern of differential fertility among the women of varying educational achievement in one region compared with this pattern in others. There are data from the 1960 U. S. Census which indicate some regional comparisons of this sort.¹

In making generalizations about the variation among states as to the degree of differential fertility-education level relationship within them, it should be remembered that all these states would rank high on any world-wide scale of educational development. The following observations summarize some of the most pertinent facets of this aspect of American regional comparisons:

1. There are only a few states, largely in the West, Southwest, and Appalachia where the fertility of white women with less than 8 years of schooling is much above those with 8 years (Mexicans are counted as white in Census Bureau figures).
2. In much of the Middle West and East the fertility of those white women with less than eight years of school is about the same or less than that of women with eight years.

¹U. S. Bureau of the Census, U. S. Census of Population: 1960, Subject Reports. Women by Number of Children Ever Born, Final Report, Washington, D. C.: USGPO, 1964, Table 50.

3. Non-white women with less than eight years of school have higher fertility than those with eight years in nearly all regions except in a few states in the Middle West, but the difference is small everywhere.
4. In the South, Negro (non-white) women with a college education are much less fertile than Negro women with less than eight years of schooling. This is due in part to the high fertility of the less educated rural Negro in the South, and in part to the strong motivation of college-educated Southern Negroes to do nothing, such as bearing many children, which will endanger their precarious economic and social status. In other regions fertility differences between the least educated Negro women and the most educated are much less marked than in the South.
5. White women with some college have slightly higher fertility than high school graduates in New England and some parts of the Middle West and the Rocky Mountains.
6. In general the regions with the lowest average fertility, the highest degree of urbanization, and the greatest per capita income evidence the smallest inverse relationship between education levels and fertility.

The high inverse relationship of schooling and fertility among Negroes in the South (1960) is similar to the high intra-rural and intra-urban regional correlations which were found in Argentine data of about 1950 using literacy and the child-woman ratio. Both Argentine and American Southern Negro educational levels are fairly advanced by world standards. When very high educational development has taken place, as in much of the urban, white, non-South United States, then the high inverse relationship between educational levels and fertility seems to decline.

Differential fertility by education levels within particular societies -- by sub-groups (other than regional) or within the whole society. The following survey will consider data on: 1) Educational effects on fertility within a common occupational or economic class; 2) Educational effects on fertility within a common rural or urban setting; 3) Educational effects on fertility within a common religious setting;

120

- 4) Educational effects on fertility within a common racial group; and
- 5) Educational effects on fertility in whole societies.

1. Educational effects on fertility within a common occupational or economic class.

Jerzy Berent reported on a British sample survey (1949) which indicated that within the same occupational class the better educated had fewer children than the less educated. The number of children for all classes was small (2.52), however, and only one of the average fertility differences was over .95 child.¹

A very carefully done study in Stockholm in the 1930's showed that better educated people in the same income groups had higher fertility than did those with less education.² That was, of course, at odds with the usual assumption that the relationship is inverse rather than direct. It should be noted, nevertheless, that the average number of live births for all these Stockholm families during the first ten years of marriage was very low (1.26).

Data from a 1964 U. S. Census fertility report based on the 1960 census indicated that married white women, 35-44, with more education within a given occupational class (by occupation of husband) generally had a lower fertility level if they had married between the ages of 14 and 21 inclusive. However, if they had married after age 22, the more educated within an occupational class differed very little from the less educated in fertility (in the higher occupational classes the better educated had somewhat higher fertility).³

¹Jerzy Berent, "Fertility and Social Mobility," Population Studies, V, March, 1952, p. 252.

²Karl Arvid Edin and Edward P. Hutchinson, Studies of Differential Fertility in Sweden, London: P. S. King and Son, 1935, p. 78.

³U. S. Bureau of the Census, op. cit., Table 39.

A survey carried out in Santiago, Chile, in 1959, indicated that education had a slightly depressing effect on fertility within economic classes; the effect was more pronounced in the poorer and richer classes rather than in the middle group.¹

2. Educational effects on fertility within a common rural or common urban setting or background.

A study of 1044 families in Puerto Rico in 1946 showed that fertility was higher among the less educated in both rural and urban settings and higher to approximately the same degree. Furthermore, small increases in the amount of schooling were associated with fairly sizeable decreases in fertility in both urban and rural settings.²

Puerto Rican data from a more recent study based on the 1960 census also indicated that differential fertility based on educational level was very much present in both urban and rural areas. However, as Table 4 shows, the difference in fertility between women with no schooling and those with one to four years was very small in the rural areas. This finding is at some variance with the Roberts-Stefani study which showed a considerable difference in fertility in rural areas between mothers who had completed only the first two grades of school and those with no school. Also it should be noted that fertility is very high in rural Puerto Rico with about 7.4 children born to the average woman by the time she is 45.

¹Jean Tabah and Raul Samuel, "Preliminary Findings of a Survey on Fertility and Attitudes Toward Family Formation in Santiago, Chile," in Clyde V. Kiser, ed., Research in Family Planning, Princeton: Princeton University Press, 1962, p. 282.

²Lydia J. Roberts and Rosa Luisa Stefani, Patterns of Living in Puerto Rican Families, Rio Piedras, P.R.: The University of Puerto Rico, 1949, Table 35, p. 289, in Jerry Combs, Jr., and Kingsley Davis, "Differential Fertility in Puerto Rico," Population Studies, V, November, 1951, p. 112.

Table 4

TOTAL LIVE BIRTHS PER 1000 MARRIED WOMEN,
AGED 45 AND OVER, PUERTO RICO, 1960*

Years of schooling completed	San Juan (Standard Metropolitan statistical area)	Urban	Rural
0	6936	6454	7830
Primary			
1-4	5962	5865	7626
5-6	5078	4942	6886
7-8	3924	4106	5271
Secondary			
1-3	3023	3295	4454
4	2386	2525	2648
College			
1+	1909	1938	1931
Total	4878	5200	7422

*Source: J. Mayone Stycos, "Education and Fertility in Puerto Rico," Paper given at the United Nations World Population Conference, Belgrade, Yugoslavia, August 30, 1965, to September 10, 1965, p. 5.

The 1964 U. S. Bureau of the Census report based on the 1960 census showed that differential fertility based on education within larger cities had narrowed considerably for white women, aged 35-44, and was nearly absent for all but those white women with less than 8 years of school. At the same time, as Table 5 shows, the inverse relationship of fertility to education remained important in rural areas.

Table 5

NUMBER OF CHILDREN EVER BORN PER 1000 WHITE WOMEN, AGED 35-44,
 MARRIED AND HUSBAND PRESENT, BY SCHOOL YEARS COMPLETED BY WIFE,
 URBANIZED AREAS (50,000 POPULATION PLUS) AND RURAL-FARM, U. S., 1960*

Years of schooling by wife	Urbanized	Rural-Farm
	Number of children per 1000 white women	Number of children per 1000 white women
Less than 8	2894	4093
8 Elementary	2480	3523
1-3 High school	2458	3261
4 High school	2295	2985
1-3 College	2334	2964
4 Years college +	2311	2563

*Source: U. S. Bureau of the Census, U.S. Census of Population: 1960. Subject Reports, Women by Number of Children Ever Born, op. cit., Table 26.

A study of expected fertility in a 1955 sample of the U. S. non-farm population showed that people who were born in urban settings and who were of the younger generation did not exhibit the usual inverse relationship between fertility and education; instead, the relationship seemed to be direct. This may indicate that a pattern is developing which will bring U. S. urban couples to fertility-education relationships similar to the pattern in Stockholm in the 1930's.

132'

Table 6
 EXPECTED FERTILITY FOR NON-FARM COUPLES, BY FARM BACKGROUND,
 BY DURATION OF MARRIAGE, AND BY WIFE'S EDUCATION,
 NATIONAL SAMPLE, U. S., 1955*

Years of marriage and wife's education	Farm background of non-farm families	
	Farm migrants expected fertility	Indigenous non-farm expected fertility
Married less than 5 years		
Grade school	3.07	^a
High school, 1-3 years	2.86	2.66
High school, 4 years	2.99	3.03
College	2.77	3.35
Married ten years or more		
Grade school	3.70	3.43
High school, 1-3 years	3.00	2.83
High school, 4 years	2.72	2.71
College	2.75	2.54

*Source: Ronald Freedman and Doris P. Slesinger, "Fertility Differentials for the Indigenous Non-Farm Population of the United States," Population Studies XV, November, 1961, p. 1970.

^aLess than 20 cases.

A 1962 survey of 2500 women (20-39 years of age) in Taiwan (in association with a very extensive project in fertility control) was made in the city of Taichung.¹ This may be considered a study of fertility in an Asian urban setting and included some data related to educational variables. Among women 35-39 years of age, and at all educational levels, it was found that women were having more children than they wanted. However, better educated women wanted and had fewer children than those with less education.

¹Bernard Berelson and Ronald Freedman, "A Study in Fertility Control," Scientific American, 210, May, 1964, p. 34.

Women with no schooling wanted about 4.3 children and had had about 5.7; women with some primary school wanted about 4.2 children and had had about 5.2; women with a primary school diploma wanted about 4.2 children and had had about 5.3; women with middle schooling wanted about 3.6 children and had had about 4.5; women with senior schooling wanted about 3.3 children and had had about 3.6. The average number of children per woman was over 5, and there was a 2.1 child differential between the best educated (3.6) and the least educated (5.7).

A sample study in 1958-59 among 900 Lebanese women in urban and village settings revealed that educational effects on fertility were small in rural areas, but that, at least among younger women in urban settings, the usual pattern of an inverse relationship could be observed.¹ In the rural villages, fertility levels (both among Moslems and Christians) seemed unaffected by educational achievement, except that those very few couples in which one member had an elementary certificate had somewhat lower fertility. In the city, it appears that, among both the younger generation Christians and Moslems, education was associated inversely with fertility (Moslem fertility in the city was generally much higher than Christian). Education among older generation village and city Moslems and Christians showed little relation to fertility except in the case of city Christians where there was a direct relationship.

A 1951 survey in Poona district, India, showed only a small educational relationship to fertility in Poona City when "educational status of

¹David Yaukey, Fertility Differences in a Modernizing Country, Princeton: Princeton University Press, 1961, Table III, p. 35; Table F-10, p. 175; and Table F-12, p. 179.

the wife" was considered.¹ This relationship seemed to exist only for those wives who had achieved above "matriculation" (10-12 years of school). In the villages and towns of Poona district no effect on fertility by the educational status of the wife could be discerned. In Poona City the total fertility rate for married women in the survey was 6456 per 1000 women, and in towns and villages it was 6408 per 1000 women.²

A study by N. V. Sovani of Kohlapur City, India, in 1945 did not reveal any effects on fertility by educational achievement.³

In August, 1964, a survey based on interviews with a 25 percent sample of all households was completed in the Pro-tharam Amphur district of Thailand.⁴ This region is predominantly rural (63 percent of the households being agricultural) and the number of interviews completed was 1,707. Only married women, aged 20-45 years of age, and with husband living were interviewed. Women with more than five years of school had fewer children by the time they were over 35 or 40 years of age than did those with no education or those with one to four years of school.

The sample survey of urban wives in Santiago, Chile in 1958 indicated that fertility declined with increased years of education, but that the decline did not amount to a whole child until the level of school had

¹V. M. Dandekar and Kumudini Dandekar, Survey of Fertility and Mortality in Poona District, Poona, India: Gokhale Institute of Politics and Economics, 1953, p. 65.

²Ibid., p. 96.

³Ibid., p. i.

⁴Amos H. Hawley and Visid Prachuabmoh, "Family Growth and Family Planning in a Rural District of Thailand," Background Papers, International Conference on Family Planning Programmes, Geneva, Switzerland, August 23-27, 1965, p. 11.

135

reached six years.¹ The women who had completed five years of higher education were slightly more fertile than women who had one to four years of higher education.

3. Educational effects on fertility within a common religious group or by attendance at church.

United States data on white women in 1960 indicated that higher educational levels among Catholics was associated with lower fertility only when the comparison was between those who had had only elementary schooling and those with some high school or a high school diploma.² However, college-trained Catholics expected to have almost as many children as Catholics with only a grade school education. Among Protestants, the college-educated and high-school graduates had identical fertility expectations, but less educated Protestants expected more births than these groups. The largest difference between Catholics and Protestants was at the college-educated level.

In Lebanon, education seemed to be associated with reduction in fertility among younger urban Moslems and Christians, but illiterate urban Moslems were much more fertile than illiterate urban Christians and better educated urban Moslems were more fertile than Christians with the same level of educational achievement.³

The Santiago survey of 1959 indicated that education was more significantly associated with differential fertility than the frequency with which people attended church. Table 7 presents the data.

¹Tabah and Samuel, op. cit., p. 293.

²Population Reference Bureau, "New Patterns in U. S. Fertility," Population Bulletin, XX, September, 1964, p. 127. (Originally from unpublished data from the Scripps Foundation for Research in Population Problems, Miami University, Oxford, Ohio.)

³Yaukey, op. cit., pp. 35, 175, 179.

Table 7

AVERAGE NUMBER OF LIVE BIRTHS PER EVER-MARRIED WOMEN, AGED 35-50,
BY FREQUENCY OF ATTENDANCE AT RELIGIOUS SERVICES, AND BY LEVEL
OF EDUCATION OF WIFE, SAMPLE SURVEY, SANTIAGO, CHILD, 1959*

Frequency of attendance at religious service by wife	<u>Education of wife</u>					
	<u>None to 3 years</u>		<u>4 to 8 years</u>		<u>9+ years</u>	
	Number of women	Average number of live births	Number of women	Average number of live births	Number of women	Average number of live births
At least once a week	105	3.60	218	3.05	216	2.50
Once or twice a month	53	4.09	147	3.18	69	2.54
Less often	71	4.10	228	3.11	92	2.67
Never	20	2.80	86	3.56	51	2.59
No answer	3	4.33	3	1.67	13	2.77
All	252	3.79	682	3.16	441	2.56

*Source: Leon Tabah and Raul Samuel, op. cit., p. 299.

4. Education effects on fertility within a common racial group.

Data from the United States¹ indicated clearly that the white and Negro (non-white) sections of the population differed sharply in terms of the effect of educational achievement on fertility. As the educational level within the Negro population advanced, fertility fell sharply, and this pattern was as noticeable in 1960 as in 1940. Among white women, aged 35-39,

¹Population Reference Bureau, "New Patterns in U. S. Fertility," Population Bulletin, op. cit., p. 137.

differing educational achievement still had an inverse relation to fertility in 1960, but to a much less degree than in 1940. Among whites, the increase of births over the 1940 to 1960 period among people in the high school educated and college group was striking, while those with no education or elementary education had only a slightly larger number of children. Among Negroes, the educational differential was even greater in 1960 than in 1940 since the better educated Negro women, aged 35-39, increased their fertility less than those with less education.

The 1964 Special Report of U. S. Bureau of the Census indicated that the greatest contrast in Negro (non-white) - white patterns of differential fertility was found in urbanized areas and in the South.¹ White women, aged 35-44, in urbanized areas had fertility levels which were relatively unaffected by educational differences except for some inverse relationship at the less than elementary level. On the other hand, Negro (non-white) fertility among women 35-44 in urbanized areas was strongly related to educational achievement, particularly in the South.

5. Educational effects on fertility within a whole country undifferentiated by economic class, rural-urban, religious, or racial characteristics.

Data was collected in West Germany in 1958 on the number of children ever born among a probability sample of all West German adults.² There was a tendency for the least and best educated younger West Germans to have a slightly greater number of children than those with intermediate educational

¹U. S. Bureau of the Census, U. S. Census of Population: 1960. Subject Reports. Women by Number of Children Ever Born, op. cit., Tables 26 and 27.

²Ronald Freedman, Gerhard Baumert and Martin Bolte, "Expected Family Size and Family Size Values in West Germany," Population Studies, XIII, November, 1959, p. 145.

attainments. However, this was not the case with older Germans; the more normal inverse relation of education to fertility held with them. It is possible that a direct relationship in West Germany between education and fertility is likely if the trend noted here is maintained. Nevertheless, all of the German groups exhibited a very small family pattern.

The data on Puerto Rico in 1960 showed that, for the whole nation, education was inversely related to fertility and that the educational effects were much more striking after women had achieved at least seven years of schooling. (See Table 8.)

Table 8
TOTAL LIVE BIRTHS PER 1000 MARRIED WOMEN AGED 45 AND OVER,
PUERTO RICO, 1960*

Years of schooling completed	Births per 1000 women	Percentage of change from preceding category	Percentage of women in category
0	7421	--	35.2
Primary			
1-4	6896	-7.0	32.8
5-6	5836	-15.4	11.7
7-8	4288	-26.5	8.5
Secondary			
1-3	3367	-21.5	4.0
4	2453	-27.1	3.4
College			
1+	1920	-21.7	4.4
Total	6224		100.0

*Source: J. Mayone Stycos, "Education and Fertility in Puerto Rico," op. cit., p. 5.

127

A study of Puerto Rican wives who gave birth in 1962 revealed that those who had more education were having babies of a lower birth order than were those with less education. This was true of women in the same age ranges and in the same marriage duration ranges (see Table 9).

Table 9
MEAN BIRTH ORDER OF PUERTO RICAN WOMEN GIVING BIRTH IN 1962,
MARRIAGE DURATION, AGE, AND EDUCATION OF WIFE,
PUERTO RICO, 1962*

Present marriage duration and age of wife	Highest School Grade Completed					
	0	1-4	5-8	9-11	12	13+
0-4 years married	2.70	2.43	2.05	1.88	1.66	1.61
age 15-24	2.2	2.1	1.9	1.8	1.5	1.4
age 25-34	3.4	3.2	2.8	2.5	1.9	1.8
age 35-44	4.1	4.1	3.3	a	a	a
5-9 years married	5.16	4.89	4.47	3.90	3.26	3.12
age 15-24	4.4	4.2	4.0	3.7	3.2	2.8
age 25-34	5.3	5.1	4.8	4.1	3.3	3.1
age 35-44	6.8	6.4	5.6	a	a	a
10-14 years married	7.24	7.14	6.64	6.00	4.44	3.86
15-19 years married	8.72	8.71	8.19	6.96	a	a
20+ years married	9.43	9.34	9.16	a	a	a

*Source: Frank Godley, "Fertility and Education Attainment in Puerto Rico," Paper presented to Population Association of America Meetings, April 23, 1965, Chicago, Illinois, Tables 3 and 5.

^aLess than 10 cases.

Although Godley does not argue that the data necessarily are fully indicative of trends in the total Puerto Rican population, there is good reason to presume that the birth pattern in 1962 was similar to patterns

in recent years; in 1963, the means were approximately the same as in 1962.¹ It appears from these data that sharp declines in fertility did not occur in Puerto Rico until the average woman approached or achieved high school graduation. The data presented by Stycos based on the 1960 census implied that fertility was only slightly affected by education until seven or eight years of school had been completed. Godley's data, however, seems to suggest that even more years of education are needed before fertility declines of important magnitude are to be expected. Part of the discrepancy may be explained by the fact that Stycos' data was concerned with all women while Godley's data had to do only with mothers. Both sets of data imply that there is little difference in fertility between women with no education and those with only one to seven or eight years of school.

A survey of 10 regions in Tunisia which included a sampling of both urban and rural regions was conducted in the Spring of 1964.² A total of 2175 married women under 40 years of age and living with their husbands was interviewed. The education level achieved by the husband (rather than by the wife) was the basis of reference for this study, and findings indicated that the husband's educational attainment had little effect on his wife's fertility. Only those families in which the husband had more than primary school education reflected even a slight tendency to produce fewer children.

¹Frank Godley, "Fertility and Education Attainment in Puerto Rico," Paper presented to Population Association of America meetings, Chicago, April 23, 1965, p. 11.

²Jean Morsa, "Tunisia: A Preliminary Analysis," Background Papers, International Conference on Family Planning Programmes, Geneva, Switzerland, August 23-27, 1965, p. 3, p. 12.

141

Before going on to some theoretical considerations and to data which are concerned with the effect of education on attitudes toward family size, contraception, and fertility control education, some comments might be hazarded about the data presented in this section.

First, the differentials in fertility associated with people who have had no schooling as compared to those with only a few years (1 to 4 or 1 to 6) are so small that elementary education may be considered to have little or no effect on family size. The following observations should make this clear:

1. White women in the United States in 1940 with no schooling had the same number of children born per ever married woman aged 35-39, as did white women with 1-4 years of school. In 1960 those with no school had 0.4 more children.
2. Non-white women in the United States in 1940 with no schooling had 0.1 fewer children than those with 1-4 years of schooling. In 1960 those with no school had 0.2 more children than those with 1-4 years of schooling.
3. In the Lebanon study, illiterate village Moslem couples married before 1929 had 1.54 fewer live births than couples who had at least one member literate but with less than 5 years of school; illiterate older village Christian couples had 0.26 more live births than couples who had one member literate, but with less than five years of school.
4. In the Lebanon study, illiterate city Moslem couples married before 1929 had 0.56 fewer children than those couples with at least one member literate but with less than five years of school; illiterate older city Christian couples had 1.50 fewer children than couples who had at least one member literate, but with less than five years of school.

5. In the Lebanon study, illiterate village Moslem couples married after 1928 had a lower fertility rate (by 0.18) than village couples with at least one member literate but with less than five years of school; younger illiterate Christian couples had a higher fertility rate (by 0.50) than couples with at least one member literate but with less than five years of school.
6. In the Lebanon study, illiterate city Moslem couples married after 1928 had a higher fertility rate (by 0.38) than couples with at least one member literate but with less than five years of school; illiterate city Christian couples had a higher fertility rate (by 0.25) than couples with at least one member literate but with less than five years of school.
7. In the 1960 Puerto Rico data all Puerto Rican women over 45 with no schooling had 0.525 more births per woman than those with 1-4 years of schooling; in rural Puerto Rico, women over 45 with no schooling had 0.204 more children per woman than those with 1-4 years of schooling; in urban Puerto Rico women over 45 with no schooling had 0.589 more births per woman than those with 1-4 years of schooling.
8. In the Taichung study those women 35-39 with no schooling had had 0.5 more children per woman than those with some primary schooling.
9. In the Poona District study illiterates and those with only a few years of schooling (up to matriculation) both in city and village seemed not significantly different as to their fertility patterns.
10. In the 1962 study of Puerto Rican birth order, women with no schooling had a less than 10 percent higher mean birth-order than those with 1-4 years of school.

11. In the Santiago survey, women, 35-50, with no school or one year had had 0.5 more live births than women with 2-3 years of school and 0.7 more children than women with 4-5 years of school.
12. In the rural Pro-tharam Amphur study in Thailand women, 35-39, with no school had 0.1 more children born than those with 1-4 years; women, 40-44, with no school had 0.7 more children born than those with 1-4 years.
13. In Tunisia women, 30-39, whose husbands had primary education had borne 0.2 more children than women whose husbands had no schooling.

Thus, only small inverse relationships seem to exist between fertility and the achievement of a small number of years of school, and in a few cases the relationship disappears altogether and becomes direct.

Second, in groups where the small family is well established and the general educational level is high, e.g. Sweden (1930's), West Germany (1958), American white Protestants (1960), American white urbanized (1960), it appears that there is a tendency for those with more years of school to have similar or slightly higher fertility than those with fewer years.

Third, in groups where the average fertility is rather high (e.g., over 4.0 children ever born per woman with completed fertility) those with more than seven or eight years of school often have markedly lower fertility than those with no school or just a few years (Taichung, Taiwan 1963; Southern Negroes, 1960; Puerto Rico, urban and rural, 1949; Puerto Rico, 1962; urban Lebanese Christians and Moslems, 1959; Poona City, India, 1951; Santiago, Chile, 1959).

Fourth, in some groups with very high average fertility it is difficult to discern any relationship between education and fertility. This is particularly so if the difference in educational achievement is minimal,

144

i.e. large numbers of women with little or no education compared to large numbers with a few years of school, and where there are not enough women educated beyond a few years to be statistically significant. (Lebanese village Moslems and Christians, 1959; Poona District non-urban, 1951; U. S. rural-farm non-whites, 1960; Quebec farm, circa 1950; Pro-tharam Amphur, Thailand 1964; Tunisia, 1964).

If there is some truth in these comments on the relation of the number of children born to the average woman in the whole group and the amount of inverse or direct relationship to be anticipated between educational achievement and fertility, it is in accord with the traditional thesis that once fertility decline begins in a group it is among the best educated that it is first noticed. But when all classes have achieved a certain high minimal level of schooling and economic well-being (usually in an urban and industrial setting), then all participate in the small family pattern (and it might even happen that the small families of the relatively less educated may be smaller than the small families of those with more educational advantage).

Some Theoretical Considerations

There are few general theories concerning the basic determinants of fertility. Many inductive generalizations have been advanced, but these rarely possess an abstract logical structure applicable to all situations. One effort to take account of the relevant long-run factors has been made by Harvey Leibenstein. His general position is that the key to the problem is motivation, and that historical, cultural, and other influences on fertility are important only insofar as they impede the rate of change in fertility patterns associated with changes in motivation. These factors might effectively prevent the spread of information and availability of

145

means, thus making alterations in motivation inoperative. Leibenstein considers that, in the long-run, this last possibility is unlikely. He further suggests that:¹

The object is to formulate a theory that explains the factors that determine the desired number of births per family. Of course, family size depends also on how many of the births survive. Our central notion is that people behave in the same as they would if they applied rough calculations to the problem of determining the number of births they desire. And such calculations would depend on balancing the satisfactions or utilities to be derived from an additional birth as against the "cost," both monetary and psychological, of having an additional child. We distinguish among three types of utility to be derived from an additional birth and two types of cost.

The utilities are distinguished as 1) "consumption" or the additional child as a source of personal pleasure to parents; 2) "production" or the added income the added child might, in years to come, contribute to the well-being of the family; and 3) "security" or the increased assurance and help, particularly in old-age, which the added child may present to the parents. The costs are: 1) "direct" or the obvious current expenses (at levels conventional in the particular society of maintaining the added child, e.g. food, clothing, schooling, etc.); and 2) "indirect" or losses due to such things as inability to work on the part of the mother, lessened mobility to gain higher income on the part of the whole family, and any foregone opportunities for more training and education which the child occasions.

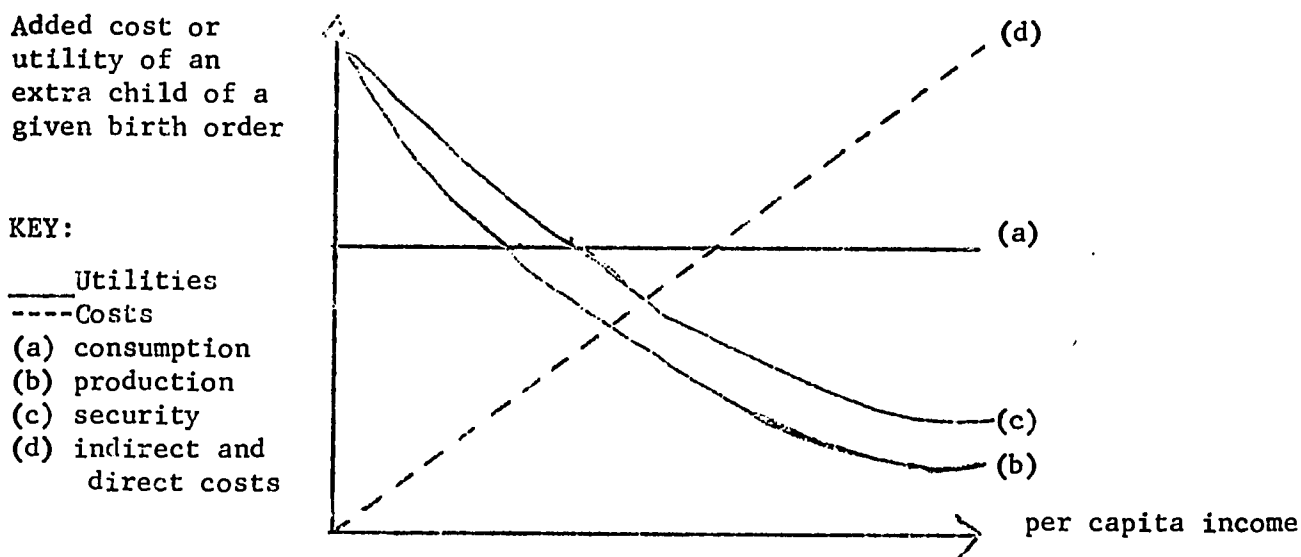
Leibenstein believes that the various utilities and cost of an extra child will vary in a determined way as a society achieves higher per capita income. Figure 1 illustrates the theory:

¹Harvey Leibenstein, Economic Backwardness and Economic Growth, op. cit., p. 161

146

Figure 1

COSTS AND UTILITIES ASSOCIATED WITH AN EXTRA CHILD*



*Source: Harvey Leibenstein, Economic Backwardness and Economic Growth, op. cit., p. 162.

The consumption utility (a) of an extra child is considered to be constant since it is not clear whether people with lower income enjoy another child more or less than those with higher income or vice versa. However, "security" utility (c) and "production" utility (b) clearly decline as people become better-off. The child in a society with higher per capita income will enter the labor force later and what income he can contribute is less imperative. The parents in the richer society can provide for their own old-age and the likelihood of adequate state assistance increases also. The direct and indirect costs (d) rise rapidly as a society becomes richer. The opportunities lost because of children are greater and the conventional minimums of maintaining a child rise. Thus, when $(a) + (b) + (c)$ become less than (d), the motive to have the next child disappears, and the wish is to prevent his coming.

147

How would educational effects in particular fit into this conception of fertility determination? Leibenstein does not consider this problem directly, but he does argue that societies with higher per capita incomes have later school-leaving ages which depress the production utility of a child and increase the maintenance costs. Furthermore, in the wealthier society, education becomes more relevant to occupation, and the opportunity costs of a child become greater, particularly if women can, through education, find remunerative careers outside the family. Although the consumption utility is drawn as constant in relation to per capita income in Figure 1, it seems likely that a more educated population would find more competing pleasures, and perhaps the consumption utility of an added child would fall. Above all, the drag of cultural tradition on the actualization of motivational changes would likely be much less in a society where education development was advanced.

In terms of the data first considered in this chapter, it would seem that only in countries which have reached relatively high per capita income and a high level of educational development has the motivation to severely limit family size become widespread enough to bring birth rates down to the 15 to 25 range. Instead of the horizontal axis in Figure 1 being per capita income gains alone, it might be more realistic to use an index of development including per capita income, educational development, and urbanization. Also, it appears from the data presented thus far, that any per capita income, education, and urbanization index has to reach relatively high levels before the motivation not to have a third or fourth child is created by the calculation of cost-utility considerations by the mass of the population. This implies that there is a tendency for the utility of 3rd and 4th order children to be similar and yet much higher

148.

than the utility of 6th, 7th, 8th, and higher birth order children which also are similar in their utility. Fifth order children seem to have intermediate utility and the situation is perhaps more variable. Thus, modest increases in social development will not reduce fertility to the two to three child level, but will leave the five to seven (or higher) pattern intact; only when extraordinary advances in social development have occurred will the relatively high utilities of 4th and finally 3rd order children be less than costs. This may explain the dichotomous tendency in the world today. Most countries have either relatively low or high fertility behavior with only a few in transition. On the other hand, the success of some pilot projects attempting direct conception control may imply that the spread between the utility of 3rd and 4th order birth on the one hand and 6th, 7th, and 8th order births on the other is not as great as this analysis suggests. Further, most of the surveys in underdeveloped parts of the world indicate that the 5th and 6th child, and even the fourth, is, on the average, perceived by the majority as not having greater utility than his cost.¹

In addition, these data suggest that people are having more children than they want or even "idealize." The disutility of the excess children is not, however, enough to drive most of the people in underdeveloped countries to prevent births by practices which were and are widely practiced in Europe and Japan, e.g. widespread coitus interruptus, abortion, abstinence, and the condom. This may imply that the mere fact that a given birth order child is thought of as bringing less utility than his

¹Comparative information supplied by Dr. Parker Mauldin of The Population Council and reproduced in Amos H. Hawley and Visis Prachuabmoh, "Family Growth and Family Planning in a Rural District of Thailand," op. cit., p. 14.

costs is not a condition which moves people to preventive action. Preventing conception or birth is just too much trouble. In some high percentage of people, simple ignorance that anything can be done to prevent birth is a factor. On both these counts a world-wide effort to increase the sex understandings of people plus a distribution of easily understood and easily used methods of birth control should pay high dividends.

The role of basic education in making such programs more certain of success is undeniable. The following sections deal with: 1) the effect of education on the "idealized" size of family; 2) the effect of education on acceptance of and willingness to use contraception and family planning; 3) the effect of education on the actual use of contraceptives; and 4) the effect of education on direct efforts at fertility control.

Education and "idealized" family size. There have been many surveys which have asked such questions as "What is the ideal number of children you would like to have?" or "If you were to advise people on the ideal number of children, what would you say?" and so forth. Most of the studies in the high fertility, underdeveloped areas have revealed that the average number of children desired or idealized is in range of 3.5 to 5.0. In the developed areas the usual figure in Europe is from 2.0 to 3.0, and in America, Canada, and Australia from 3.0 to 4.0.

Some of the data on ideal family size in both developed and underdeveloped countries have been broken down by the educational level of the respondents. In West Germany, the 1958 National Survey disclosed that level of education made no difference in attitudes toward "ideal" number of children. This was true for older respondents (over 45) as well as younger.¹

¹Freedman, Baumert, and Bolte, op. cit., p. 145.

A survey conducted in 1952 in Detroit was concerned with the number of children a cross-section of adults (over 21) considered "ideal."¹ The inverse relationship of "ideal" family size with educational level was somewhat more pronounced among those with some rural background than it was among those with only urban background. The differences, however, were very small. The most striking exception to the usual depressing effect of educational achievement on fertility attitudes in this study was that the attitudes of Catholics with 12 or more years of school were very similar to those of Catholics with less than 9 years of school, and were not similar to those of their Protestant educational equals.

The 1964 survey of Pro-tharam Amphus in Thailand revealed that education made some difference in the ideal number of children posited by the respondents; women with five or more years of schooling idealized 6 fewer children than those with no education.²

In Taichung, Taiwan, a 1962 pilot study of 241 couples disclosed that education was slightly associated with a smaller ideal family size. The only significant difference was that people with high school education or more had an ideal which was about half a child below the average.³

The 1959 study in Santiago revealed that the average ideal number of children was 4.18. Education was inversely associated with the ideal size, but only slightly and not at all levels. (See Table 10.)

¹Ronald Freedman and Harry Shapr, "Correlates of Values About Ideal Family Size in Detroit Metropolitan Area," Population Studies, VIII, July, 1954, p. 41.

²Hawley and Prachuabmoh, op. cit., p. 19.

³Ronald Freedman, "Changing Fertility in Taiwan," in Roy O. Greep, ed., Human Fertility and Population Problems, Cambridge, Mass.: Schenkman Pub. Co., 1963, p. 122.

Table 10

AVERAGE IDEAL NUMBER OF CHILDREN, MARRIED WOMEN 35 TO 50 YEARS OF AGE,
BY EDUCATIONAL LEVEL OF WIFE, SAMPLE SURVEY, SANTIAGO, CHILE, 1959*

Educational level of wife	Number of women	Average ideal number of children
0-1 years	51	4.76
2-3 years	113	4.57
4-5 years	118	4.34
6 years	153	4.13
7-8 years	69	4.32
9-10 years	115	3.68
11 years	37	4.08
12 years	64	3.78
13-17 years	14	3.64
18+ years	11	4.00
No answer	6	4.67
All	751	4.18

*Source: Leon Tabah and Raul Samuel, "Preliminary Findings of a Survey on Fertility and Attitudes Toward Family Formation in Santiago, Chile," op. cit., p. 293.

In the Lebanon study of 1959 the majority of village women, when asked what number of children they would advise a friend (in similar circumstances to their own) to have, refused to name any specific number. Most answered, "As God wills" or "As many as possible." Those village women who would advise typically suggested four or five children (Moslem median 4.7; Christian median 4.1). From two-thirds to three-fourths of the uneducated city women (66 percent of Christians; 75 percent of the Moslems), and about 90 percent of the educated city women did specify a figure (4).¹

¹Yaukey, op. cit., pp. 65-75.

Differences in educational achievement within the same country appear to have little influence on the idealized size of family. However, nations which are more educationally developed do, as a whole, idealize smaller size families than do less developed countries.

The effect of education on family planning attitudes and the use of contraception. Some surveys have been conducted in widely scattered parts of the world to determine the attitude of people toward family planning efforts and their willingness to use conception control. The basis of reference for these surveys ranged from a simple literate/non-literate measure in one study, to studies which included more extensive gradations of educational attainment and, in one instance, an additional division into both rural and urban sectors.

In Thailand, a 1964 survey conducted in a rural district showed that wives with five or more years of education were slightly more favorable toward family planning than were wives with no education or only one to four years.¹

A 1962 survey of 10 villages in East Java (55 percent of population in agricultural pursuits) disclosed that literacy was associated with a slight increase in the favorable response of wives toward family planning, but that it made little difference among husbands.² The proportion of wives and husbands who stated they were willing to use family planning methods was very high. The authors of the report indicate that these high percentages are somewhat doubtful because it is questionable that the villagers really understood what the question implied.

¹Hawley and Prachuabmoh, op. cit., p. 23.

²H. Gille and R. H. Pardoko, "Preliminary Findings of a Family Life Study in East Java," Background Papers, op. cit., p. 16.

In Tunisia, a sample survey of 10 areas, both rural and urban, was conducted in 1964 which revealed in each sector a modest association between education of both husband and wife and favorable attitudes toward family planning.¹

A 1962 pilot survey of 241 couples (wife 25 to 29 years old) in Taichung, Taiwan reported that the majority of people approved family planning unconditionally, but those with more education showed definitely a higher acceptance rate than those with less.²

Apparently people are favorable to the idea of family planning and the use of contraceptives. However, more education seems to incline people toward a somewhat stronger position of approval.

Education and the actual use of contraception. The study of fertility in Lebanon revealed that very few villagers (2 percent of the Moslems and 16 percent of the Christians) had ever used any method of conception control (the few who had tried to control conception had almost all used coitus interruptus). In the city the proportion of educated and uneducated people who had ever tried to control conception was quite high (56 percent of uneducated Moslems; 60 percent of uneducated Christians; 83 percent of educated Moslems; and 86 percent of educated Christians), and the large majority had tried to control conception by using coitus interruptus or the condom. A few mentioned sterilization (10 percent of educated Christians) and rhythm (14 percent of educated Christians); a few other methods (douche, sponge, diaphragm, jelly) were mentioned by from one to nine percent of the women in the various city categories. Almost no villagers

¹Morsa, op. cit., pp. 16-18.

²Freedman, "Changing Fertility in Taiwan," op. cit., p. 122.

154

had ever used abortion to limit births, while induced abortion had been used by about one-sixth of uneducated city women and a little over one-fourth of educated city women.¹

Tunisian data are available from the 1964 survey on the use of any method of contraception by level of education of husband and wife, and by age of the wife. The areas for this information include: a coastal region of six relatively urban areas which have a high proportion of clerical workers, and a poor suburb of Tunis which has a high proportion of unemployed and poorly educated recent migrants from the interior. In all cases, the level of education was positively associated with greater use of contraceptive methods.²

In Puerto Rico, surveys of a group of health clinic and hospital out-patients and pre-maternal clinic clients were made in 1953-54. The subjects were primarily lower income people, and 888 wives and 322 husbands were interviewed in a stratified (by rural-urban, history of contraception, and length of marriage) sample, while an out-patient study interviewed 3000 (2667 married females and 304 married males) throughout Puerto Rico. In both surveys people who had more education were much more prone to have used or be using some birth control methods.³

When these low income people had achieved as many as nine years of schooling they were very likely to have used or be using birth control methods. A small amount of schooling (1-4 years or 1-3 years) did not

¹Yaukey, op. cit., pp. 65-75.

²Morsa, op. cit., pp. 16-18.

³Reuben Hill, J. Mayone Stycos, and Kurt W. Back, The Family and Population Control, Chapel Hill: University of North Carolina Press, 1959, p. 165.

105

seem to increase the incidence of birth control use over the incidence found among with those with no school, although the effect of a little schooling did appear to be significant among young people in the stratified sample.

About 63 percent of the out-patient sample and 48 percent of the stratified sample had used or were using mechanical-chemical means (sterilization, condom, diaphragm, jelly-cream-foam), and educational achievement was associated with a higher incidence of the use of mechanical-chemical means. However, of those practicing birth control at the time of the interview, only about one-quarter were using mechanical-chemical means; the rest were using abstinence, rhythm, or withdrawal. Educational achievement seemed to increase the likelihood of the use of rhythm among those who were not using chemical-mechanical birth control.¹

The 1962 pilot study of 241 couples in Taichung, Taiwan, with wife aged 25 to 29, showed that education was an extremely significant positive factor in the use of some method of family planning.² Of those families in which the husband had no schooling, none had practiced contraception, and only 9 percent of the couples in which the wife had no schooling had practiced contraception. If the husband or wife had attended junior secondary school the figures rose to 41 percent and 60 percent respectively, and among families where either was a senior secondary graduate the figures were 62 percent and 71 percent respectively.

As in Puerto Rico, it was only among Taichung people who had more than a few years of primary school that actual use of family planning methods was widespread.

¹Ibid., pp. 169-170.

²Freedman, op. cit., p. 122.

Education and direct efforts at fertility control. Direct attempts at adult fertility control education generally have either or both of two distinct aims: (a) to alter the utility perceptions of people concerning the birth of extra children and to raise the conventional cost minimums of extra children; and (b) to overcome ignorance of methods by which births may be prevented if such is or becomes the desire. A host of such programs has been introduced throughout the world during the past decade, and there is no space here for a detailed consideration of them. It should be noted, however, that highly successful programs seem invariably to occur in countries, or areas of countries, which are better educated than is typical for their geo-cultural area, whereas the marked failures appear to occur in areas which are average or below average in level of education.

Very successful programs have been reported in Japan,¹ South Korea,² Taiwan,³ Hong Kong,⁴ Singapore,⁵ and from a highly literate village in Ceylon.⁶ In all of these areas the levels of literacy and education are

¹Yoshio Koya, "Five-Year Experiment on Family Planning Among Coal Miners in Toban, Japan," Population Studies, XIII, November, 1959, pp. 157-63; and Minoru Myramatsu, "Family Planning Programs in Postwar Japan," Background Papers, International Conference on Family Planning Programs, Geneva, Switzerland, August 23-27, 1965.

²Youn Keun Cha, "Development of the Korean National Family Planning Program," Background Papers, op. cit.

³Berelson and Freedman, op. cit.; and T. C. Hsu and L. P. Chow, "Family Planning Health Program in Taiwan," Background Papers, op. cit.

⁴Daphne Chun, "Experience with Family Planning Programs -- Achievements and Problems, Hong Kong," Background Papers, op. cit.

⁵Maggie Lim, "Malaysia-Singapore," Background Papers, op. cit.

⁶Arne Kinch, "A Preliminary Report from the Sweden-Ceylon Family Planning Pilot Project," in Clyde V. Kiser, ed., Research in Family Planning, Princeton, N.J.: Princeton University Press, 1962; and "Family Planning Activities in Ceylon: Some Background Information," Background Papers, op. cit.

quite high by Asian standards. Markedly unsuccessful programs have been reported in India¹ and Pakistan,² both with relatively low levels of education, and in an up-country tea estate in Ceylon, which had a much lower level of literacy than in the Ceylonese village mentioned above.³ Moving away from Asia, a massive government program in the U.A.R., which has attained levels of education more similar to those of India and Pakistan than to such nations as Japan, South Korea, or Taiwan, has had little effect since 1956.⁴ There are also 115 family planning clinics in South Africa, 21 in Kenya (14 of which are in Nairobi), 5 in Nigeria, 3 in Uganda and 2 in Zambia.⁵ The majority of clients are urban, economically better-off and generally middle class.

In Latin America the problems of setting up such direct education programs are complicated by the opposition of the dominant Roman Catholic Church. Nevertheless, programs have been instituted in Chile⁶ and Puerto Rico⁷ which have been fairly successful in spite of the circumspection

¹John B. Wyon and John E. Gordon, "A Long-Term Prospective-Type Field Study of Population Dynamics in the Punjab, India," in Kiser, op. cit.; and R. A. Gopaldaswami, "Family Planning: Outlook for Government Action in India," op. cit.

²Enver Adil, "Experience with the Family Planning Programme in Pakistan -- Achievements and Problems," Background Papers, op. cit.

³Kinch, op. cit.

⁴Hasan M. Husein, "Experience with Family Planning Program in the U.A.R., Achievements and Problems," Background Papers, op. cit.

⁵John C. Caldwell, "Experience with Family Planning Programmes: Achievements and Problems -- Africa," Background Papers, op. cit.

⁶Hernan Romero, "Experience with the Family Planning Programme in Chile: Achievements and Problems," Background Papers, op. cit.; and Tabah and Samuel, op. cit.

⁷John F. Kantner and J. Mayone Stycos, "A Non-Clinical Approach to Contraception," in Kiser, op. cit.

158

required by the position of the Church. Both of these countries are as advanced educationally as Taiwan or South Korea.

The association between level of education and receptivity to these direct programs of adult education is quite striking. Moreover, the relationship appears to hold true in both urban and rural areas, thus eliminating urbanization, with all of its concomitants, as a cross-cutting variable. This would seem to lend support to the position taken above that education beyond a minimal level is likely to alter the perceptions of the relative costs and utilities of extra children beyond 2 to 4 children in favor of limiting family size. This relationship can be explained in terms of the theory presented in Chapter 3 where it was suggested that education, by increasing the level of "individual differentiation," increases the receptivity of the individual to new, or "innovative," information. The information communicated in these direct adult fertility control education programs is certainly new, certainly innovative, to the target population. Those with more education would be expected to be comparatively more receptive to it, as would those areas with higher levels of education.

Fertility and Qualitative Aspects of Education

Education has been considered as synonymous with schooling. At this point, a qualitative question arises. In international, regional, national, and group comparisons, is an appreciable difference in educational relationships with fertility to be noted if equally educated groups or areas attend schools with sharply different philosophical premises and types of courses offered and required? There are little data upon which to base some response. A rapid perusal of international and intra-national figures would lead one to minimize the importance of variation in types of schooling in

regard to the question of fertility. Marxist educational systems, Catholic educational systems, or the "practical" American public school system seem to be equally closely associated with reduced fertility (when the degree of illiteracy has been reduced to small proportions of the population). The data seem to argue for the need of very high educational development if fertility is to be curbed, whether the schooling is of a religious, ideological, or pragmatic type. Sweden, Hungary, and Belgium all have very low birth rates, but the dominant philosophical ethos of the three school systems are quite different -- secular public, Marxist, and Catholic respectively. States within the United States with a high proportion of children in religious schools have, for the most part, about the same or lower fertility rates as those with low proportions. Also, states reporting the smallest inverse relationship between education and fertility among white women 35-39 are Connecticut, Pennsylvania, Massachusetts, Iowa, New Hampshire, South Dakota, Vermont, Maryland, Nebraska, Montana, Minnesota, Wisconsin, and New Jersey. This group includes states with relatively high and others with relatively low proportions of pupils in religious schools.

On the other hand, it is evident from recent studies that those Catholics in the United States who go to parochial school from primary level through college are more prolific than Catholics who attend secular schools. Westoff elaborates on certain aspects of this finding.¹

One of our most interesting and clearest findings relates to the connection with fertility of education in the Catholic school system. When the sample of Catholic couples is divided into those whose education was largely or entirely in Catholic schools and colleges and those whose education

¹Charles F. Westoff, "The 'Family Growth in Metropolitan America' Study: A Progress Report," in Clyde V. Kiser, ed., Research in Family Planning, Princeton, N.J.: Princeton University Press, 1963, p. 189.

was secular, sharp differences emerge in fertility - planning success as well as the number of children desired. In general, Catholics educated in secular schools behave more like Protestants in their fertility behavior than they do like Catholics with religious education. Although some selectivity of the more religiously oriented Catholics into the Catholic educational system undoubtedly occurs. . .it is reasonable to assume that reinforcement of formal or informal Catholic attitudes toward the family and birth control also occurs. Higher education thus seems to imply two quite different fertility value systems, depending on whether or not it is in a secular or a Catholic college or university.

No doubt societies with advanced educational development and relatively low general fertility may have extremely devout groups such as American Hutterites or Irish Catholic parochial school and Catholic college graduates who have fertility patterns similar to peasants in Latin America or Asia. But these groups are too small to strongly influence national or regional trends. If they grew to important size, it is likely the general values of the advanced society would modify their average fertility habits.

The Effect of Education on Mortality

It is clear that it was among peoples with increasing amounts of per capita income and education that death rates first fell to the extraordinarily low figures which prevail today. Most of the decline occurred in the mortality of people from birth to ten years of age. Some improvement also occurred in other age brackets but to a diminishing degree as age increased. The reduction in mortality which grew out of the knowledge generated in the wealthier and better educated countries has spread to the poorer countries, and death rates are now lower in Taiwan, Malaysia, Ceylon, Mauritius, British Guiana, Costa Rica, Salvador, and Mexico than in most of Europe. This is partly because of age structure, but even after adjustments for this, these relatively poor and badly educated areas would still

- 161 -

have death rates approximately the same as the majority of countries with high per capita income and nearly universal literacy. It would appear that mortality can be reduced greatly in a country even though the population is poor and far from fully literate.

The prime relation between mortality and education in low income and low literacy countries is the need for at least a few educated people willing to administer or let others administer health programs which use knowledge from the developed countries. With this condition fulfilled, mortality rates can be reduced greatly. It is another question as to the time span over which they can be maintained at low levels.

There is probably some relation within a country between education and mortality. Better educated people, on the average, tend to take advantage of health information, new medical procedures, and approved patterns of sanitary practice to a greater degree than those without as much education. Of course, higher per capita income and conditions of work are probably equally or more important. In general, however, the relation of education to mortality is probably much more tenuous than the relation of education to fertility.

Education and Migration

A number of questions can be posed concerning the relationship between education and migration. Three fairly obvious queries are: 1) Does an area with a higher educational level tend to be more restrictive in its immigration laws and enforcement than a country with lower levels of education? 2) Are better-educated populations in otherwise similar circumstances more prone to migrate when opportunities arise? 3) Is there a differential effect on the fertility and mortality patterns of the receiving

country between allowing entry to a number of better educated people as opposed to allowing an equal number of poorly educated people?

The first question is practically impossible to answer in any definitive manner. Over the past century all countries have moved to increasingly restrictive immigration policies. Those countries with the most politically and socially sensitive labor movements (which often would be associated with better-educated workers) probably moved most rapidly toward restriction. In France and the United States sentiment mounted in the late 19th century against free immigration and by the 1920's in both countries highly restrictive measures had become law.¹ The restrictionist sentiments rose as the general educational level of the working classes rose in both countries. Recently, in well-educated Switzerland, a general revulsion at the presence of so many foreign workers has forced highly restrictive policies on the Swiss government. In Hong Kong, to the contrary, restrictive action has come only when the pressure of numbers threatened such basic services as the water supply. The recent ending of Mexican "bracero" contract labor importation in the United States was largely due to agitation among labor circles in highly educated California rather than to pressure from the less active and less educated working people of Texas and Arizona. These examples are by no means conclusive and certainly many other factors than the general level of education are more important in determining the course of restrictive action on immigration.

¹See Paul Médecin, Étude sur l'admission des étrangers en France, Paris: Larose and Tenin, 1909, pp. 155-162; and Donald R. Taft, "Problems Arising from Minorities," in F. J. Brown and J. S. Roucek, Our Racial and National Minorities, New York: Prentice-Hall, 1937, pp. 20-25.

In response to the second query, it would seem that any relation between level of education per se and propensity to migrate would be a function of the tendency of education to raise material aspirations. In recent history, the Europeans have been the most migratory people in relation to the size of their base population. The period of the great European migrations of the 19th and early 20th century coincided with rising literacy levels in nearly all the sending countries. Population pressure in China, India, and Java did not result in vast outpourings to the still open countries during the first 75 years of the 19th century. The level of literacy also stayed very low during this period in these countries, while European educational levels were relatively much higher and were advancing.

When whole peoples migrate as a unit, the question of the educational level seems irrelevant; but when, as in the modern world, migration is, for the most part, an individual matter, a certain amount of education seems to be positively associated with the propensity of people to move.

A response to the third question involves not only the level of education of the immigrants, but the level of the receiving country as well. Even though the immigrants may be advanced by world standards, they may be relatively deprived by the standards of the receiving country. Certainly most of the immigrants coming to the United States after about 1880 must have seemed poorly educated and uncultured to the native American whites. This aspect of the situation probably influenced the ideas of Francis Walker who became famous in American social thought for his thesis that immigration does not increase population but merely substitutes one group of people of a different race or nationality for the native babies who remain

264

unconceived. Walker put his position in the following words:¹

But it may be asked, Is the proposition that the arrival of foreigners brought a check to the native increase a reasonable one? . . . I answer, yes . . . Americans became increasingly unwilling to bring forth sons and daughters who should be obliged to compete in the market for labor and in the walks of life with those whom they did not recognize as of their own grade or condition.

But Walker's theory, even if partially true, may have little relevance to an immigration which is characterized by a higher educational level among the immigrants than the average native of the receiving country. As an example, what effect did the German and North Italian immigration have on Brazil? In general it appears that the Germans tended to form relatively prosperous enclaves which may have reduced the upward mobility of native Brazilians. This is made clear in a comment made by Mortara on the basis of a study of linguistic assimilation of immigrants in Brazil:²

The level of education attained by immigrants may have two opposite effects. The tendency of those who were taught in their motherland is to cling consciously or otherwise to the culture they have acquired; those who cannot read or write feel little compunction about losing something they never possessed. On the other hand, those who possess a genuine cultural background are far better fitted than illiterates to assimilate a second culture. Educational influences go in the first direction in the case of Brazil, especially as far as communities of German origin in the southern states of Santa Caterina and Rio Grande del Sud are concerned. Even so, there are noteworthy examples of the opposite trend, especially among settlers of Italian origin in the state of Sao Paulo.

¹Francis A. Walker, "Restrictions of Immigration," Atlantic Monthly, LXVII, June, 1896, p. 825.

²Giorgio Mortara, "Immigration to Brazil: Some Observations on the Linguistic Assimilation of Immigrants and Their Descendants in Brazil," Population Studies - Supplement on Cultural Assimilation of Immigrants, March, 1950, p. 44. Mortara uses the Spanish, "Rio Grande del Sud," instead of the Portuguese, "Rio Grande do Sul."

165

German migration to Brazil could not have had the effect of merely displacing the natives as Walker argued was the general effect of immigration. If anything, it may have tended to perpetuate the traditional fertility levels.

Some have argued that if immigration accelerates urbanization it will depress fertility rates. Julius Isaac suggests that this is what happened in the U.S.:¹

Large-scale immigration has been one of the main causes of rapid urbanization and industrialization of the United States since the end of the nineteenth century. Urbanization and industrialization, as we have seen, bring about a rapid decline in birth rates, and hence a certain causal relation is given between immigration and the decline in fertility.

The immigration of which Isaac speaks was, for the most part, poorly educated when compared to the native population. Would an immigration of those with equal or better education have accelerated urbanization? In Brazil, the German immigration did not speed urbanization; in fact, most Germans became agriculturists or ranchers. The Italians did accelerate urbanization by their business activities, especially in Sao Paulo.

There are no clear or specific data available to allow even a tentative generalization about the difference poorly educated immigrants have on population trends within the receiving country as opposed to a relatively better educated group. However, some generalizations can be made concerning immigration and fertility. If the immigration speeds urbanization it tends to reduce fertility. If it solidifies class lines, it tends to impede lower fertility. If it tends to raise the general level of literacy, it tends to lower fertility. If it merely substitutes one lower class for

¹Julius Isaac, Economics of Migration, New York: Oxford University Press, 1947, p. 190.

another, it has a slight effect on fertility. If it brings literacy level and general per capita income levels down, it tends to raise fertility rates in the receiving country.

In this chapter we have considered many of the investigations which shed light on the interrelationships of population and education. It appears that educational gains which occur when countries are already somewhat urbanized and have already a fairly large proportion of the population with median school years completed relatively high (e.g. 6-7 years) may act to depress fertility, but that in other more underdeveloped nations, such educational gains are not likely to depress fertility to any significant degree. However, educational efforts directly aimed at fertility decrease may have important effects in less developed areas. The relationship between education and mortality and migration appears to be much less direct and of much less significance for the general problem of population control. All generalizations concerning linkages between population and education must be regarded as tentative, for the research thus far undertaken in this area has only utilized crude and aggregated educational measures.

CHAPTER 5

URBANIZATION AND EDUCATION

As has been asserted in a number of contexts in the preceding chapters urban areas are the principal locus of the many social changes subsumed by the term development. These changes usually occur first, and, at any given point in time, will be most pronounced, in urban areas. Thus although we have dealt separately with such dimensions of development as social mobility, national integration and population change, these as well as other social changes in the development process might all have been examined in their relation to the urbanization process. This chapter while not attempting a synthesis of preceding explorations does emphasize the relationships between certain components of urbanization. And to avoid excessive repetition with discussions found in other chapters, the analyses of linkages between urbanization and education are brief and illustrative rather than comprehensive.

The present analysis of urbanization and education describes a conceptual model of urbanization and traces some of the consequences suggested by that model for the role of education in social change. Urbanization means more than simply the growth of cities. In addition to this apparent feature of urbanization, a number of other changes serve to transform a rural and agricultural society into an urban and industrial society. The growth of cities, as is emphasized throughout this study, signals a broad social transformation.

Educational changes are a necessary accompaniment to the urban transformation of societies, largely because all social institutions must be involved in the broad scale of changes that are taking place.

The growth of urban populations, for example, brings pressure upon the educational institutions to develop those adaptive attitudes and values to make urban social life viable.¹ The movement toward an urban-based, industrial economy requires functional readjustments in the educational process which can supply the necessary labor skills and labor commitment to sustain industrial enterprises. In short, the educational supports of rural values, an aristocratic stratification system, and agricultural work patterns cannot satisfy the dramatically different demands created by an urban industrial society. Educational content, as well as the definitions of who is to have access to educational facilities, must be adapted to the changing social demands of a society in the process of development.

The impression should not be created that urbanization and educational changes are, or must be, perfectly attuned to one another. There will tend to be serious time lags, often created by the social barriers to change that exist in every society. A certain amount of tension and friction seems to be inevitable, which is why the development process is never smooth but is always beset with difficulties.

Some comment on the theoretical tone of this chapter is in order. To understand the complex dynamics of urban change and to organize what has become a growing mountain of empirical data, it is necessary first to be prepared to develop models broadly theoretical. This does not mean the pursuit of theory for its own sake. Rather, it is being argued that a

¹A report by the United Nations, for example, contends that many of the so-called consequences of urbanization and industrialization can be understood as the "attempted preservation of preindustrial ways of life in an alien and inappropriate environment." United Nations, Processes and Problems of Industrialization in Underdeveloped Countries, New York: 1955, p. 119.

169

logically consistent theory which can be subjected to empirical testing in whole or in part is necessary for better understanding of the nature of social change and its consequences. Inasmuch as the very study of development depends upon the assumption of similarity and comparability between societies, it is the better part of scientific strategy to consider the assumption in an explicit theoretical manner.

The Urban Continuum

A strategic dimension of the analysis relies on the concept of a continuum of urban societies; i.e., on a model of urbanization in which one extreme is typified by traditional and preindustrial societies, the other by urbanized societies with all variations theoretically ranged between the two. The idea of an urban continuum has a long history in sociology, exemplified by Redfield's "folk-urban,"¹ Toennies' "Gemeinschaft-Gesellschaft,"² and Becker's "sacred-secular"³ contrasts, to mention only a few. The common feature of these and similar models is the view that societies can be graded in terms of one or more urban characteristics, such as the degree of secularization, the number of voluntary associations, the complexity of the division of labor, and the degree of reliance upon secondary social controls. Although these models have correctly viewed urbanization as a form of broad social change, they have suffered from at least two faults. First, they have defined variables vaguely.⁴ Redfield,

¹Robert Redfield, The Folk Culture of Yucatan, Chicago: University of Chicago Press, 1941.

²Ferdinand Toennies, Fundamental Concepts of Sociology, trans. by C. P. Loomis, New York: American Book Company, 1940.

³Howard Becker, Systematic Sociology, New York: Wiley & Sons, 1946, pp. 222 ff.

⁴Horace Miner, "The Folk-Urban Continuum," American Sociological Review, 17:529-37, October 1952.

170

for example, combines a number of ideas in his concept of "secularization" so that it is impossible to find empirical referents that can match the concept. Second, most models of urban continua have attempted to cover the full range of history and, therefore, have had to sacrifice specificity to maintain the historical sweep. After all, if the urban definition has to encompass Ur in the third millenium B.C., ancient Athens, and modern London, there is not a great deal that can be said about a class of phenomena that includes such extreme variations.

The model described here is based upon the general form of an urban continuum. Like the earlier models, it assumes that there is a general line of urban development from "nonurban" to "urban." However, it avoids certain faults that have weakened earlier formulations. For one thing, the model is phrased around four variables which have specific empirical referents. For another, the model is limited to the special historical case of industrial urbanization. It is generally concerned with the urbanizing process that began in the West around 1800 and that is currently being reiterated in developing countries elsewhere throughout the world. Finally, the model does not assume a single straight-line evolutionary process through which all societies must pass. On the contrary, the model posits certain relationships between the four variables of urbanization and claims only that an increased rate of growth in one variable carries consequences for the others.

The process of industrial urbanization today, then, can be seen as a reiteration of the process experienced by Western nations earlier.¹ The time and culture spread between say, England of 1800 and Ghana of 1960, is not as great as it may seem on the surface. To be sure, while many features

¹Leonard Reissman, The Urban Process: Cities in Industrial Societies, New York: The Free Press, 1964, pp. 158-194.

are unique to each particular historical case, the main outlines are strikingly similar. The developed and urbanized countries of the world are intimately involved in the transition of the underdeveloped countries by a number of economic, political, and other social ties. The underdeveloped countries, on their side, have taken the developed countries as a deliberate model to emulate in major particulars, e.g. the "demonstration effect." Finally, certain functional relationships in the development process do operate so that a choice of one goal carries unavoidable consequences for other goals. For example, the attainment of increased industrialism would seem to demand an investment in education to produce the necessary skills. Similarly, the effective mobilization of a society in order to achieve the benefits of an urban industrial social structure necessitates the development of a middle class. In short, in order for the developing countries to achieve their major goals, they must also incorporate some of the features that have characterized the earlier process in the West; not because of imitation alone, but because there are functional relationships that link the stated goals to certain consequences.

Clearly, the assumption for considering urbanization today as similar to the process earlier experienced by the West depends upon the specification of the variables or characteristics that both periods share. The assumption rests, it is tentatively hypothesized, upon four variables that phrase a theory of urbanization: (1) Urban growth, (2) Industrial growth, (3) Rise of a middle class, and (4) Nationalism as a dominating and unifying political ideology. These four variables encompass the primary dimensions of urbanization and are an integral part of that transformation.

Urban growth (not to be confused with the broader concept, urbanization) is an ecological measure, referring to the increased concentration

of a country's population in cities. Such concentration, in part, comes from a response to the labor force requirements of industrialization. However, even before industrial demands are sufficiently large and stable to support a sizeable number of people, urban migration may well occur. Rural poverty, land tenure patterns, the breakdown of the traditional joint or extended family system, and the pull of the city may all combine to overcome inertia and to move people off the land.¹ Often, in today's developing countries, the situation may not be much improved for the migrants, but they continue to come. There is little question about the rapid rate of such migration and about the severe urban problems it creates.² The rapidity can be appreciated by noting the differences in Table 1 below.

Table 1
POPULATION IN LARGE CITIES (100,000 +)
(In Millions of Persons)

Area	1800		1850		1900		1950	
	Number	% of Total Pop.	Number	% of Total Pop.	Number	% of Total Pop.	Number	% of Total Pop.
World	15.6	1.7	27.5	2.3	88.6	5.5	313.7	13.1
Asia	9.8	1.6	12.2	1.7	19.4	2.1	105.6	7.5
Europe ^a	5.4	2.9	13.2	4.9	48.0	11.9	118.2	19.9
Africa	.3	.3	.3	.2	1.4	1.1	10.2	5.2
America	.1	.4	1.8	3.0	18.6	12.8	74.6	22.6
Oceania					1.3	21.7	5.1	39.2

Source: United Nations, Report on the World Social Situation, New York: 1957, p. 114.

^aIncluding USSR.

¹The International Labour Organization reports that economic push factors, even when quite marked, are not sufficient to cause a large movement out of agriculture without the presence of strong economic pull factors (at least as perceived by rural folk); the two must operate together. I.L.O., "Why Labor Leaves the Land, A Comparative Study of the Movement of Labor Out of Agriculture," Studies and Reports, New Series No. 59, Geneva: 1960, p. 209.

²United Nations, Community Development in Urban Areas, New York, 1961.

173

During the nineteenth century, Europe's urban population increased from five and one-half million to 48 million -- a rise of 43.5 million. In Asia from 1900 to only 1950, the urban population increased from 19.5 million to over 105 million -- an increase of 86 million in fifty years. In other words, Asia's urban population increased twice as much and twice as fast as that of the West.¹ Urban increases in both Africa and the Americas were almost equally dramatic and swift. Many of the problems faced by developing nations today have their genesis in the magnitude and pace of urban growth that they are experiencing. Housing, health, transportation, and the development of attitudes and values attuned to the urban environment are among the most pressing, just as they were (and in some cases remain) the major problems faced by urbanizing societies everywhere.

Industrial growth is the second variable to be identified in the urbanization process. It refers not only to the growth of industry and commerce, but also to the relevant attitudes that make such industrial development possible. At a manifest level, this process involves a major economic shift from agriculture to manufacturing, from the land to the urban factory. Understandably, the shift also requires concomitant alterations in a number of related economic sectors, including the credit structure, employment, the labor force structure, and resource allocation. At the latent level, a number of critical changes also are made in

¹Another way of viewing the growth in urbanization is indicated in the following projections: In 1950, 21 percent of the world's population lived in cities of 20,000 or more and 13 percent in cities of 100,000 or more; the estimated figures for 1975 are, respectively, 30 percent and 19 percent. Philip Hauser, "The Social, Economic and Technological Problems of Rapid Urbanization," in Industrialization and Society, edited B. F. Hozelitz and W. E. Moore, Unesco-Mouton, 1963, p. 201. Some estimates indicate that by the year 2000 as much as 60 percent of the world's population may be urbanites.

174

education, family structure, class structure, and political forms. Societies cannot be shifted from one economic base to another without compensatory readjustments taking place throughout the social structure.¹

Industrialization is most frequently the major goal -- not necessarily achieved of course -- that developing nations explicitly set for themselves. It is as an industrial nation that they aim to succeed. Certainly, one need not expect that these developing countries will traverse exactly the same path as that taken earlier by Western countries. At the very least, it can be expected that some of the intermediary steps will be avoided simply because the developing nations can benefit from the most recent technological knowledge in public health, safety, productivity, and resource uses. However, the outstanding comparable features in the two time periods rest upon the recognition that the social changes engendered by industrialization turn out to be very much the same: a similar need for work commitment, for a detailed division of labor, for a rational work organization, and for consumer aspirations, to mention only a few.² In other words, the desire by the leaders of developing nations to emulate the industrial features of the developed nations necessarily involves them in a reiteration of the process followed earlier in the West. The functional prerequisites of the process leave no other choice once the goal of industrialization is chosen.


¹In its fullest dimension, industrialization makes it necessary, as Frankel has phrased it, "to repair and maintain; to think of tomorrow, not only of today; to educate and train one's children; to prepare oneself for new activities; to acquire new skills; to search out new contacts; to widen the horizons of one's experience; to invent, to improve, to question the 'dead hand of custom' and the heritage of the past." Herbert Frankel, The Economic Impact on Under-developed Societies, Oxford: Oxford University Press, 1953, p. 69.

²See in this connection, Wilbert E. Moore & Arnold S. Feldman (eds.), Labor Commitment and Social Change in Developing Areas, New York: Social Science Research Council, 1960.

175

The emergence of a middle class into leadership is the third component in this model of the urban process. The shift from land to factory, as noted above, necessitates deep structural changes, among which is a restructuring of power relationships in society. It is not a simple case of power exchange from those who have it to those who want it. Rather, the dynamics associated with industrialization necessarily result in the shift of power from a land-based aristocracy to a new, rising, urban-based elite that is most identified with the changes involved in that transformation. A middle class is not simply a passive recipient of the power that develops from the restructuring of social relationships. Much more importantly, it is the group that supplies the leadership for and the forces behind the change. It should be kept in mind that the impetus for this massive social transformation must originate and be fed by some social stratum; in other words, by some group of human agents. Neither the older aristocracy nor the large bulk of the traditional peasantry or primitives in pre-urban societies wants to or can supply that force. The aristocracy would have things stay as they are, or failing that, make the most minimal concessions to change. The rural peasantry, on the other hand, lacks the knowledge, the values, and the conceptions of the industrial urban future. Their view of social change is very restricted. Most frequently, it is limited to changes in land tenure and ownership patterns because their social world is bounded by the land and by agriculture. A middle class alone is committed to the success of industrial urbanization and possesses the talents needed to lead for such changes. This was true earlier in the West, and is true again today in the developing countries.

The composition of the middle classes in the developing countries is different from that of the bourgeoisie earlier in the West, but the functions



that are served have remained generally the same. Instead of the merchants, entrepreneurs, and traders, the emerging middle classes today more often consist of government bureaucrats, the military, the clergy, teachers, lawyers, and other professionals. The classes tend to be numerically small at the beginning of the development process, but the roles they fill in directing the nation along that process is a critical one. It must also be noted that education provides a major channel for the development of a middle class, especially in its early formation, and as one survey concluded, "a higher education is often the passport that takes a man from the lower ranks of society into the middle classes."¹

Not only is there a similarity in function served by the middle classes today in the developing countries and that served earlier by the middle class in the West, but there is a similarity in "content." That is, a large number of the leaders in today's developing countries have been educated in the colleges and universities of the West. They have learned about Western values and Western history, and though they do not seek to duplicate that history in all particulars, they do seek to emulate certain of its features.

The rise of nationalism is the fourth and final variable to be considered in this theory of urbanization. Nationalism (not to be confused with the narrower concept, patriotism) serves the function of supplying a unifying set of values during the transition period of social change and later. It is a rationale that legitimates and endows the efforts of the middle class with purpose and meaning, not alone for them, but for all of society. In the West earlier, and again today, nationalism is the dominating ideology of the middle classes during their emergence into power. For nationalism

¹Development of a Middle Class in Tropical and Sub-tropical Countries, Brussels: International Institute of Differing Civilizations, 29th Session, 1956, p. 467.

177

seeks to replace older traditions, former loyalties, and a broad spectrum of beliefs that were once adaptive but no longer can be for the society that is emerging in the urban process.

Nationalism is a concept that emphasizes a sense of national identification, bolstered by social institutions and new social traditions. It is more than a psychological reality; it must also be a social reality.

Nationalism, to be successful in its fullest meaning, must unite individuals by a mutual bond of acceptance of a set of institutions and values. For this is the significance of the nation, which in Renan's excellent phrase is a plebiscite de tous les jours. The nation comes to replace the myriad social realities that have formerly divided a population: language, dress, custom, kinship, and religion. In the face of such manifest and traditional divisions, nationalism can be used to supply the explanation and the mechanism whereby the unification of a nation can be accomplished; where the obvious differences that separate a people are considered as less important than the common bonds that unite them. As Silvert has rightly concluded,¹

Nationalism as a social value has been the major cohesive force to date within each separate modern society, and . . . its existence in underdeveloped areas is a natural part of the process of development, very often anticipatory of the social class structure which is its only real justification and its only ultimately legitimate social reason for being.

In summary then, the process of industrial urbanization involves a consideration and analysis of four components: the growth of cities, which serve as the ecological arenas for change; the growth of industry, which

¹K. H. Silvert (ed.), Expectant Peoples: Nationalism & Development, New York: Random House, 1964, p. 26. Nationalism as defined by Silvert and as used in this chapter is closely related to the term national integration as used in the previous chapter. However, since our analysis of national integration places somewhat more emphasis on the structural demands of nationhood and somewhat less on valuational needs, a distinction is maintained.

178

supplies the economic basis and the economic character of the transformation; the emergence of a middle class, which supplies the necessary leadership for the change; and finally, the rise of the ideology of nationalism, which supplies the rationale, the legitimating purpose, and the social cohesion that can mobilize a population behind the change. These four components, it is argued, were the essential features in the urbanizing process earlier experienced by Western nations, and are evident again today to fulfill the same functions in those countries beginning the same social transformation. But to reiterate a necessary caution: The two processes are not exactly the same with regard to many particulars; however, in terms of the four variables that have been identified there is room for comparing the similarities that do exist.

A Model of Urbanization

Using the four variables as a basis, an ideal-typical model of urbanization has been constructed. The model represents an abstract statement rather than an historically factual one. The purpose here is twofold: first, to illustrate a logical set of relationships; and secondly, to establish a means for comparing the levels of urbanization of different countries. In the first instance, the model can suggest possible hypotheses for testing; in the second, the model yields the means for constructing a typology of societies.

A word about the empirical measures used for the model. It is exceedingly difficult to devise indicators which will directly measure such phenomena as size of the middle class or nationalism. This is particularly true if one wishes to use these measures for cross national comparison. While the indicators used here to measure these two variables are far from

satisfactory, they are conceptually relevant. Moreover, the model does not stand or fall on the empirical measures: i.e., the latter are used more as a suggestive, than a final, reliable index.

Using the data available for several countries, representing a wide range of development, the following measures of the four components of the model were selected.¹ The measure of urban concentration was the proportion of the population living in cities of 100,000 or more. The measure of industrialization was the percent of the national domestic product accounted for by manufacturing. The measure of the size of the middle class was taken as per capita income, the assumption being that the higher the per capita income, the larger the size of the middle class. The measure of nationalism was taken as the percent of the population 15 years old and older that was literate. Here, the assumption was that nationalism requires a certain amount of information and an ability to deal with abstractions -- requirements fostered by a minimal level of education and the ability to read.

The procedure was then to plot these measures against each other, using the data for the several countries. The resulting pattern of relationships was one that fit both logical demands and the expectations that the theory would support and explain. Industrialization and urban concentration were found to be correlated positively and in a linear fashion. The middle class variable bore a curvilinear relationship to those two variables, increasing more slowly than either industrial or urban growth at the beginning, then rising sharply later in the process. Nationalism presented a curvilinear relationship that was the mirror opposite to that found for the middle class variable. Nationalism tended to increase more rapidly at

¹A full description of these measures and their rationales is given in Reissman, op. cit., pp. 202-209.

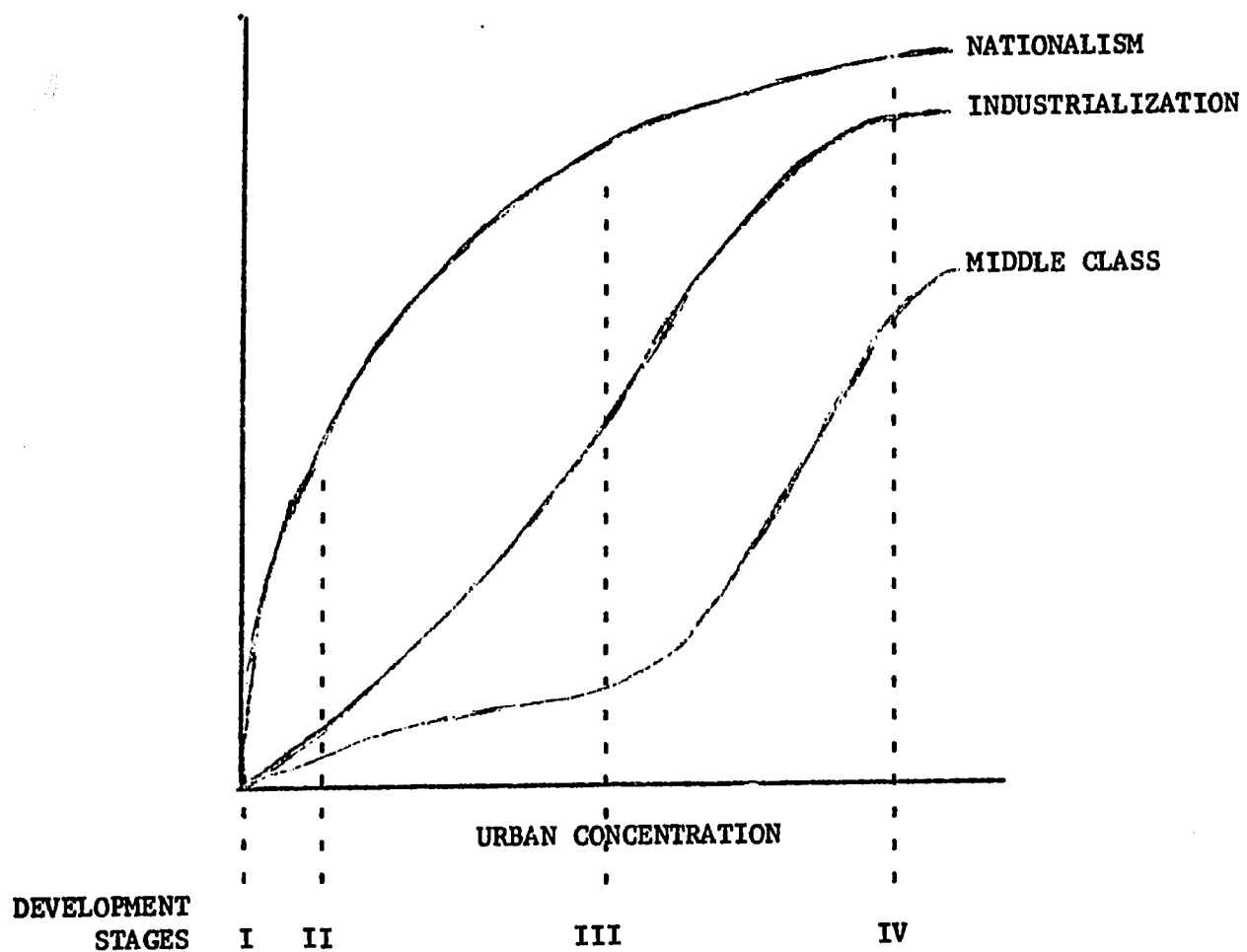
182

the first than any of the other three measures, then leveled off later on. Using these trends as suggestive, an abstract model of the relationships just described was constructed. The result is shown in the accompanying diagram, "A Conceptual Model of Urbanization." It should be noted that differences in population size do not affect the model since each of the measures is based upon population proportions. Also it should be emphasized that this model does not assume a rigid and necessary line of evolutionary change. Societies, in reality, will deviate from the relationships that are hypothesized here. Furthermore, not all societies will move the full distance indicated by the model, but instead, may stop at any point for any reason. The model, in short, is hypothetical and suggestive as models in science should be. Its utility stems from the suggestive relationships it can generate.

Four "development stages" have been indicated in the diagram of urbanization. These should not be read as evolutionary stages through which all societies must pass, but rather as critical cutting-points in the process of urbanization where societies are confronted with possible alternative choices. Stage I symbolizes societies that have not yet started the process. Urban concentration is low, industrialization has not yet begun, and the middle classes are almost absent. The beginnings of nationalism are evident, but it is still an ideology primarily based on a common antipathy toward the outsider, "negative nationalism." At this stage, as at later stages, societies may move along any one or more of the variables of change; i.e., urban growth, industrial growth, middle class expansion, or nationalism. Separate consequences develop for each society depending upon the particular path that is chosen or followed.

181

A CONCEPTUAL MODEL OF URBANIZATION



Stage II societies show certain significant developments. There is some evidence for the beginnings of urban concentration, of a start toward industrial development, and for signs of a small middle class cadre. Nationalism has reached or is close to the apex and is now at the point of being converted to a more positive ideology than it was at the earlier stage. The sentiment that served earlier to build cohesion by antipathy, as in anti-colonialism, must now be converted to construct a more viable social solidarity through internal nation-building.

Stage III represents societies that are well along the path of urbanization. Nationalism has attained a relatively high and stable level indicating that the political institutions of the new society have taken hold. Urban concentration has reached a point where almost half of the population is now resident in cities. The urban population, in turn, is reasonably securely supported by a growing rate of industrialization. However, the significant characteristic of societies at this stage is the expansion that is ready to occur in the middle classes. Until this point, the benefits of industrial urban development have been shared among those who are members of a relatively small elite. They have by no means filtered down significantly to the lower strata. The impetus for an increase in middle class growth comes from two directions. The economic impetus is engendered by the fact that future industrial expansion depends upon widening the consumer and labor markets; the first to create a demand for industrial products, and the second to build a labor force with sufficient technical skills to meet the developing demands of industry. The increased growth of a middle class also comes from social and political sources in that demands for social mobility and for higher living standards become more pressing than before. The desire to share in the fruits of industrial

182

urban development now become widespread and provide the basis for demands by different groups in the population who are not yet in the middle classes.

Stage IV describes societies that are more or less fully developed. Each of the variables has begun to level off because the formerly high rates of growth could not be maintained indefinitely. Since these societies are not the main concern of this essay, there is no need to describe them any further than as shown in the diagram.

The Role of Education

It is unlikely that the patterns that have been described will be followed exactly. Some countries have over-urbanized relative to their levels of industrial growth. Others have delayed any serious middle class expansion, and so forth. Deviations are likely to occur in the actual case. However, the model is suggestive in that it can systematically indicate the nature of those deviations and some of the consequences that follow from them. A consideration of some of the possible variations in connection with the role of education is now in order.

It should be clear from the model that there are multiple functions to be served by education, relative to each of the four variables that have been identified. A first priority must be given to education for nationalism, by which is meant education aimed at creating a sense of national identity. The possible role of education in this regard was described in some detail in Chapter 3 and only a few comments need to be added here. The aim of nationalism is to build legitimation for the nation as a polity and to achieve unity as quickly as possible. Education provides the only means for mobilizing belief behind this ideology and for giving it substance.

184

As Sigmund has noted,

It is not only the radical or revolutionary regimes that put a high priority on basic education and political indoctrination. All the modernizing nationalists recognize that the educational system can be used to develop loyalty to the nation -- and to the party, often considered to be synonymous with the nation. The line between education for citizenship and political indoctrination is a thin one . . . but the modernizing nationalists universally accept the need for a high political content in education.¹

Because of the low levels of literacy that are usual in a country at the early stages of its development, informal educational channels come to be relied upon in large measure: public broadcasts, the wide use of graphic symbols, and pilot projects of one sort or another with a high probability of success. Formal education must also be fostered in order to build a basis for future development and to ground the social institutions of the new nation as firmly as possible. After all, this transition period is marked by the destruction of most of the traditional values and institutions; a new and functional set of beliefs must be developed as soon as possible.

Having begun that process, education must then seek to alter the direction of nationalism toward positive development goals rather than simply establishing the nation in the sentiments that people currently hold. Hence, new traditions must be taught to replace the old. New institutions and values must be developed to fill the gaps left by the destruction of the older values. If education fails in this function, the most likely deviation from the model that can occur is an extension of nationalism for its own sake, but without any supporting institutions to give it substance and reality.

¹Paul E. Sigmund, Jr. (ed.), The Ideologies of the Developing Nations, New York: Praeger, 1964, pp. 9-10.

185

Education for industrial skills and for an industrial work ethic is another function that education serves, one that becomes a pressing need after national independence has been more or less attained. It is along this dimension that most discussion of manpower and educational resources are phrased, within the context of what has been called the "manpower" or "human capital" approach. Harbison has summarized the features of this dimension, based upon the conclusions of an analysis of 75 countries ranging from underdeveloped to advanced.

First, there is a strong correlation between a country's educational development and its economic productivity
Second, education alone is not enough to assure a nation's prosperity All that we can predict is that a well-educated and motivated people will do extraordinarily well
Third, in its educational investment a country must adopt a balanced program, suited to its own needs and state of development, or it may run into trouble Fourth, a country's educational investment and goals must be shaped realistically to the level of its economic development
Fifth, education generates a strong demand and push for more education¹

However, there is some tendency to overstress the importance of this one educational function. For one thing, foreign assistance for this educational purpose is usually more likely to be made available than for any other. For another, industrial growth comes to be defined as the main symbol of successful development. Yet, the undue allocation of resources for this educational function, alone, can seriously endanger the future success of development. As the model implies, industrial growth of the sort typified by Western countries requires a solid middle class base as well as strong national traditions and institutions. A technically competent labor force by itself is not enough to assure continued industrial

¹Frederick Harbison, "Strategies for Investing in People," in John W. Hanson & C.S. Brembeck (eds.), Education and the Development of Nations, New York: Holt, Rinehart & Winston, 1966, pp. 156-7.

growth, nor is it any guarantee of a democratic political form. The latter requirements must be met by a broader educational function than the one supplied by a highly concentrated industrial arts education. Those who would emphasize these manpower aspects of education to the exclusion of other facets are, thereby, seriously misreading the history of the West and the nature of social change in today's development process.

One of the most subtle functions that education has to serve is to create a middle class environment. The inculcation of such middle class attitudes as the aspirations for upward mobility, the stress upon individual achievement, a responsible social ethic, the respect for law, and a pragmatic orientation to the social environment all necessitate a relatively long educational process. Those attitudes require a generation or more to be developed and they come about not through formal instruction alone, but through other experiences as well. In large measure, it can be said, development has not succeeded until the mechanisms for the creation of this middle class base have been established. Chapter 2 in considering the routes of social mobility gives particular attention to this problem.

Education for urban living is the last function that might be mentioned. Little has been done formally in any country regarding this function. Urban clusters make mass education feasible because the students are close at hand and educational facilities can be concentrated in a most efficient manner. Yet, very few countries have used those facilities for the purposes of formally educating a population to the urban environment. In developing countries, as in those that are already developed, much of the learning of the urban life style takes place through the informal channels of the neighborhood, the voluntary associations and the peer group. Several chapters in this study have made reference to this problem

187

in one context or another. Of particular relevance in terms of the relation of the school to urban behavior are Chapter 6 which considers the behavioral requirements of a developed society, and Chapter 4 in which the interactions of urbanization, population change, and education are analyzed.

It can be seen from the above analysis of the relationship between education and the components of the urbanization model that conflicts may exist. A policy of "education for industrialization," at least to the extent that it implies meeting high level manpower requirements, may result in different kinds of education for different social groups. Educational facilities, thereby, may become converted to serve elite groups rather than opening up the entry into the middle class stratum as suggested by the model. The point to be made, however, is not that such a likelihood exists always, but instead, that there are consequences that result. As the model suggests, at some point in the development process there must occur a marked increase in the size of the middle classes: an opening of social mobility opportunities for those in the lower strata of the class structure. If this fails to materialize then the entire urbanization process is endangered. For one thing, the supply of needed talent for later industrial development is not prepared; for another, there is insufficient commitment to national development because too few have shared in the fruits of such development. In terms of the indicated developmental stages, if a nation is to progress beyond the point noted as Stage III, it is necessary to have established a sufficiently good system of education that is open on a mass level.

There are, of course, several possible educational implications of any alterations in the patterns depicted in the model. A nation, because of rapid economic growth and existence of certain egalitarian principles,

might see an unusually rapid increase in the middle classes. Such increase if, for example, it were largely represented in the number of clerks and government employees might take place without parallels in industrialization. Such a situation would call for appropriate changes in educational goals and curricula. More likely, rapid increase in the size of the middle classes would be accompanied by sizeable increases in industrialization. If there were a lagging development of nationalism some educational adjustments eventually would have to take place (see Chapter 3).

To take another case, rapid nationalism may reflect a priority to mass education, a policy not in keeping with maximizing the schools contribution to enlarging the middle classes since middle class roles generally demand at least a secondary education. Or conversely an educational policy designed to provide, for those capable, the academic or technical skills which permit enlargement of the middle classes might not allow giving priority to a program for the dissemination of national symbols through mass education.

Conclusions

It should be evident by now that the model of urbanization that has been discussed is not meant to be read as a rigid, evolutionary, design. The value of this presentation is that it allows the analyst to evaluate the empirical deviations from the ideal model. In other words, it is not argued that societies must indeed develop in precisely the manner indicated; rather it is contended that consequences of the deviations from the pattern that might occur can be better understood.

There is always asymmetry in the development process with regard to the four variables that have been identified, a condition with consequences for educational change as well. A frequent deviation from the model, for

example, is the rate of urban growth, which tends to be more rapid than the rate of industrial growth. The effect is to populate cities with more people than can be supported with the available resources of a developing nation. Energies and resources that might otherwise be employed more effectively to increase per capita income must be diverted to alleviating some of the more glaring miseries and evils created by over-urbanization.

The asymmetry that can develop as regards the middle class has already been indicated. The early middle class elite may well develop strong elitist desires and seek to preserve itself as an elite by keeping out later entrants to the class position. Education, as one of the major channels for upward social mobility, becomes a tool to freeze the class structure at an early stage of development. In short, the development process is never smooth and even.

Another important point in connection with the application of the model needs to be mentioned. Societies in the process of urbanization are confronted with a number of alternatives during the transition phases. Not all of the necessary developments can occur at the same time. Hence, a society at Stage II, for example, may turn to any one of the four possible variables as the primary channel for the transition to the next stage. The society, by whatever means, may seek to discourage urban migration and to concentrate upon industrial growth wherever possible. It may, in that connection, seek to enhance its rural environment as a means of cutting down on the number of urban migrants. Certainly, part of such a program would involve a decentralized educational structure by which the schools move out into the country rather than being concentrated in the cities. These choices, of course, are not always consciously made,

190

but on the basis of the model, conscious choice must sooner or later enter the picture: the sooner it does, the more rational and efficient the program is likely to be.

The point to be stressed in all of this is that there is no one path to development, but instead, a number of different paths. Yet, if successful development is to be attained -- or at least approached as a possibility -- with a minimum of friction and social destruction, then some balance must be achieved between the several components that have been identified. In that regard, education can play a pivotal role by effectively preparing a society for the next order of changes that must come about.

CHAPTER 6

EDUCATION AND BEHAVIORAL CHANGE

As all of the previous chapters have indicated, development is not only defined and justified in individual as well as institutional terms but it involves basically certain beliefs and actions of individuals. Identifiable individual commitments, value orientations, attitudes and behavior are prerequisites as well as products of the development process.

The literature on development supports the notion that certain perceptions and values facilitate and others hinder the establishment of behavior patterns that support development. In addition to the references identified in Chapter 1 many others could be mentioned. The differences in the development of Japan and Thailand have been analyzed in terms of the dominant value systems in these countries.¹ Many instances have been cited by Foster in which innovations are resisted because they run counter to the existing values, beliefs and attitudes of people in traditional cultures.² Hauser provides evidence to support his contention that one barrier to economic development in less developed areas consists of value systems which conflict with material aspirations.³ The need for value changes in developing nations and for a type of education which ties together cognitive and affective

¹Eliezer B. Ayal, "Value Systems and Economic Development in Japan and Thailand," Journal of Social Issues, 19, 1, 1963, 35-51.

²George M. Foster, Traditional Cultures and the Impact of Technological Change, New York: Harper and Brothers, 1962.

³Philip M. Hauser, "Cultural and Personal Obstacles to Economic Development in Less Developed Areas," Human Organization, 18, (2), 1959, 78-85.

learning (i.e. education which provides both the skill and the desire necessary for change and growth), is stressed by Moore.¹ McClelland and Hagen² emphasize the need structure, motives and personality underlying industrialization, while W. Rostow³ speaks of education for new roles and the rise of new values in the process of economic growth.

The lists of social and psychological prerequisites to development are quite reasonable -- economic development, for example, obviously rests on a willing labor force -- but the major foundation of such enumeration appears not to be theory but the casual observation of western experience. Many of the prerequisites, such as political stability or innovating personality, are poorly defined in an operational sense and refer to rather large and amorphous phenomena. Prerequisites are obviously related, but the exact nature of these relationships usually remains obscure. In addition, the two levels of description -- social and individual -- are often confused (as in the case of need achievement). Finally, and most importantly, the lack of a theoretical substructure makes it difficult to draw implications for action. It is almost impossible to propose plans for the creation of amorphous prerequisites, and the programs which are suggested must necessarily be so far-reaching that their successful implementation is highly unlikely. Saving, for example, is a prerequisite, but unless this phenomenon is analyzed in all its complexity, and unless its relations to other variables

¹Wilbert E. Moore, "The Social Framework of Economic Development," Tradition, Values and Socio-Economic Development, Braibanti and Spengler (eds.), Duke University Press, 1961.

²David McClelland, The Achieving Society, New York: Van Nostrand Co., Inc., 1961; Everett E. Hagen, On the Theory of Social Change, Homewood, Illinois: The Dorsey Press, 1962.

³W. W. Rostow, The Stages of Economic Growth, Cambridge, 1960.

are clearly recognized, few meaningful suggestions for increasing saving among peasants, for example, can be made.¹

It is the purpose of this chapter to present a theoretical basis for the analysis of social and psychological prerequisites to development. Procedures for the creation of prerequisites will be deduced from this foundation, and one set of procedures, education, will be analyzed in detail.

"Behavioral" and "Social" Prerequisites

In focusing on the individual in the development process, most of the literature that exists deals with the attitudes, values or various "internal states" of individuals that support economic growth, social mobility, etc. Although such an approach has merit, it seems worthwhile to concentrate on the overt behavior of individuals. Such an approach, centering initially on the behavior of individuals, promises to increase the precision of the analysis of prerequisites since present tools of the social sciences are well able to handle phenomena such as the actions of individuals and small groups.²

The importance to development of individuals' actions is most apparent when men are seen as entrepreneurs, government administrators, voters, investors, consumers of goods, "innovators," and individuals with achievement motivation. Yet thus far sociologists and anthropologists have concerned themselves largely with the "social" rather than the

¹Raymond Firth and Basil S. Yamey, Capital, Saving and Credit in Peasant Societies, Chicago: Aldine Publishing Co., 1964.

²For examples of such an approach, see Peter M. Blau, Exchange and Power in Social Life, New York: Wiley, 1964; and George C. Homans, Social Behavior, New York: Harcourt, Brace and World, 1961.

194

"individualistic" aspects of development. The emphasis on aggregates and the exclusion of individuals reflect methodological limitations¹ rather than the nature of the real world, however, as is indicated by the fact that most studies of social prerequisites rely heavily on descriptions of behavior and are thus concerned, at least implicitly, with the actions of individuals.² Much of what is currently classed under the rubric of social and cultural prerequisites, including such abstractions as the "long-range point-of-view," is in essence the delineation and elaboration of the common elements or distinguishing characteristics found in a variety of individual or group actions.³

If development involves, to a large extent, various actions of individuals and groups, then the prerequisites of such component elements as industrialization or urbanization must also be considered in terms of individual and group activities. In order for economic development to occur, for example, people must save and invest, men must innovate, peasants must be willing to work in factories. It is appropriate, then, to speak of behavioral prerequisites, i.e. the behavior patterns which must exist in a society if development is to come about.

¹The most important methodological problem is found in the analysis of the relationship between individuals' actions and the social context. One recent solution has been proposed by George C. Homans in his presidential address "Bringing Men Back In," American Sociological Review, 29, (6) 1964, pp. 809-818.

²Bert F. Hoselitz, Sociological Aspects of Economic Growth, Glencoe: Free Press, 1960; Moore, op. cit.

³For example, Levy discusses industrialized societies in terms of pattern-variables, but shows that these refer either to behavior itself or to norms which determine action; Marion J. Levy, The Structure of Society, Princeton: Princeton University Press, 1952, esp. chapter 6.

195

It is postulated in this chapter that men's actions are a function of learning principles and the social context -- men learn to behave, and this learning always occurs in a social context which determines what is to be learned. Since the behavior of men is greatly influenced by the nature and operation of the social environment, it is possible to speak of social prerequisites as those characteristics of the social context which determine the behavior patterns necessary for development. Since behavior can be shaped, maintained, and altered in a wide variety of contexts, and by means of different procedures, much variation in the social and cultural determinants of behavioral prerequisites is possible; social prerequisites, then, may be expected to vary much more than behavioral prerequisites. The two levels of analysis -- individual and social -- are related by means of psychological, i.e. learning, principles, and thus the behavior of individuals, the characteristics of the social system, and psychological (learning) principles are the major components of the analysis of non-economic prerequisites of a developed society.¹

The basic idea of this analysis is that behavior is learned in a social and cultural context and that it also influences the development of future social and cultural characteristics by being part of them. Economic development, no matter what the circumstances, includes specific behavior patterns associated with the rise of industrialism and its social concomitants. The shaping and maintenance of these activities, in turn, proceeds

¹The two levels of analysis may be conceived as being linked by a "model of man" which includes propositions concerning the determinants of behavior and which specifies the role of the social context. For a general discussion of models of man, and the difficulties involved in their creation and application, see Herbert A. Simon, Models of Man, New York: Wiley, 1957.

in accordance with learning principles whose specific operation varies with the social and cultural characteristics of different societies while their general nature has cross-cultural validity.

From this view it follows that learning, either by direct experience, through modeling, or through the receipt of new information, is the primary mechanism of behavioral change. The application of learning principles within a particular societal framework, therefore, provides an efficient means of promoting the behavioral prerequisites of development within that society.

"Psychological" prerequisites for development discussed in this paper refer primarily to "behavioral" prerequisites and are considered in terms of behavioral principles and learning procedures. Considered in this way, psychological prerequisites need not be stated with specific reference to development since such principles and procedures underly any behavior and are not unique to the activities related to development.

An emphasis on behavioral prerequisites rather than psychological prerequisites focuses not so much on man's internal state or various mental phenomena as on the activities of men. However, these approaches have an element in common since "perception" or "cognition" plays an important part in each. This point of commonality becomes most apparent later when the role of the school is discussed.

Before the analysis of behavioral prerequisites can be undertaken, and before the procedures for their creation and maintenance can be outlined, a model of man which ties together the activities of men and the operations of the social context, must be briefly described.

A Behavioral Model of Man

Since this analysis of prerequisites begins with the behavior of individuals and assumes that most patterned action is learned, the underlying model of man must consist of propositions concerning the determinants of behavior and the ways in which behavior patterns are established, maintained, and altered in static and changing social contexts.¹

The basic postulate of the proposed model of man is that most behavior patterns are learned through differential reinforcement. That is, not all possible activities, but only those deemed "desirable" by a community or society are rewarded; others are not, and some may be punished. The specific principles involved in the shaping of behavior are the following:²

1. Behavior (R) is established and maintained or weakened by a reinforcing (S^r) or aversive (S^a) stimulus which follows it. More accurately, the presentation of reinforcing stimuli (loosely speaking, rewards) or the removal of aversive stimuli increases the probability that the behavior pattern will be repeated, whereas the presentation of an aversive stimulus (loosely speaking, punishment) or the removal of an S^r decreases the probability that the behavior pattern will be repeated in the future.

2. The effectiveness of any reinforcing stimulus depends in large part on the extent of an individual's deprivation, whether actual or

¹Although much work was done with animals, recent studies have concentrated on the analysis of principles underlying human behavior. The principles incorporated into the model of man under discussion have all arisen from work with human beings; for examples of such work see Arthur W. Staats, Human Learning, New York: Holt, Rinehart and Winston, 1964.

²For a more complete exposition of these propositions, and their empirical foundation, see Arthur W. Staats and Carolyn K. Staats, Complex Human Behavior, New York: Holt, Rinehart and Winston, 1963. For applications of behavioral principles, see Leonard P. Ullmann and Leonard Krasner, Case Studies in Behavior Modification, New York: Holt, Rinehart and Winston, 1965.

imagined. Deprivation, which makes reinforcing stimuli effective by their capacity to reduce it, may be primary (largely physiological) or secondary (largely cultural), and thus may be expected to vary from one person to another, one culture to the next.

3. When an S^r is presented after an activity has been performed in a particular context (e.g. telling a joke in a group of men), the behavior is likely to be repeated in the same or similar context, or a specific aspect of it (a group of MEN). Those elements of the context in whose presence a behavior pattern was reinforced, usually called discriminative stimuli (S^D), eventually come to "control" the behavior; that is, the probability of their presence being followed by the associated activity increases and approaches certainty. If another aspect of the context, if present, is not followed by the reinforcement of an activity (S^Δ), or is followed by aversive consequences, (e.g. telling the same joke in mixed company), the probability of the activity being repeated in the presence of that element (MIXED company) will decline and approach zero.

4. The schedule of presentation of any S^r affects the smoothness and continuation of behavior. If rewards are presented continuously, behavior is easily maintained while reinforcement lasts, but upon the termination of rewards, extinction proceeds rapidly. If rewards are presented intermittently, behavior will be equally well maintained, and after the termination of reinforcement the response will continue to be made for a relatively long period of time. The shaping of behavior is usually accomplished best with an initially continuous schedule of reinforcement.

5. Behavioral elements are usually combined into patterns, such as writing a letter. These patterns, in turn, are usually parts of more complex chains in which one person's actions or others' reactions to them

199

become reinforcing and discriminative stimuli for further actions, thus "tying together" large numbers of behavior patterns of the same individual and also of different people.

According to this behavioral model, the social context of the individual, including his immediate family, the various groups to which he belongs, and the society of which he is a part, exerts a powerful influence on behavior. The immediate and wider social context, especially the system of ideal values and the operating norms arising from it, determine, as illustrated in Figure 1:

1. The contingent stimuli. The values and norms of a society perform functions analogous to those performed by the experimenter in the laboratory.

2. The relationship between behavior and contingencies, i.e. which actions are to be rewarded or punished.

3. The state variables. Values, and especially norms, create secondary (or learned) deprivations (e.g. social isolation in a community emphasizing togetherness), but they also affect primary deprivations by defining the "accepted" ways in which deprivations may be reduced, for example, by labeling certain foods taboo.

4. The discriminative stimuli. By reinforcing particular behavior patterns when they appear in a specific context, the normative system of a society determines which aspects of an individual's context will eventually take on controlling properties. Honesty in social relations, for example, will usually be rewarded except in special circumstances when norms of politeness indicate the necessity (and consequent rewards) of white lies.

5. The schedule of reinforcement. Whether rewards will be presented quite often, or only occasionally, is determined by values and norms.

-220-

It is apparent from this brief discussion of learning principles and the operation of the social context that the behavior of individuals can be understood only if the present and past context is known. If the context is static, the behavior of people affected by it will also be rigid, while behavior patterns will change when the social context is altered.

In this description of learning principles the frame of reference was the operation of the social environment and the individual behaving within it. This view is adequate when there is sufficient time to observe both people and the social context, i.e. when observers have accurate knowledge of a society's values and norms. At times, however, the investigator may find himself in situations where there is not enough time to observe accurately the operation of a community or nation. This would be true especially in heterogeneous and rapidly changing communities, where the normative structure is likely to be so complex and fluid that its effects on the behavior of individuals would be difficult to assess merely by observation.

In such cases, researchers may have to take into account a person's cognition of discriminative stimuli and his perception of reinforcement probabilities. Cognition and perception are part of the above model of man, but they are usually accepted as constants -- it is assumed that individuals correctly perceive the possibilities of rewards -- and thus perception and cognition are not considered to be important variables in the analysis of learning. When, however, reinforcement probabilities cannot be determined by observations of events, individuals may have to be asked: "If you do this, what will be the consequences?" Individuals' cognitions and perceptions, then, may have to be included in the analysis of the shaping, maintenance, and alteration of behavior.

702

While the above principles influence much of the learning process, it must be recognized that they may operate in a number of different forms. For example, the individual himself need not experience the consequences of his actions, because behavior patterns may be established by observing others' activities and the effects of their actions. This kind of learning, called modeling, has been extensively investigated in the area of child development.¹ The underlying principle -- differential reinforcement -- is the same as in the above paradigm, but direct, personal experience is not necessary. Bandura and Walters go so far as to suggest that one of the major aspects of schooling is precisely the provision of models, for example through stories, biographies, etc. According to these authors, individuals learn how to act in part through "vicarious reinforcement," that is, by observing the consequences of other people's behavior.

The Components of Behavioral Prerequisites

Although many prerequisites of the developed society can be stated in terms of behavior, they consist, actually, of many different but related activities and various elements of learning principles responsible for their shaping and maintenance. Behavioral prerequisites, thus, must be considered as sets of elements or behaviors having their own maintenance system. All of these elements must be analyzed, in as great detail as possible, for the social environment does not affect the composite set as a whole; only its individual elements are determined by the social context. In addition, it should be noted that every action is a link in a chain. There are preceding activities which act as discriminative stimuli, and any behavior pattern may function as a discriminative stimulus for certain

¹Albert Bandura and Richard H. Walters, Social Learning and Personality Development, New York: Holt, Rinehart and Winston, 1963.

-203

succeeding actions at the same time that it may be a (conditioned) reinforcer for certain preceding patterns. The behavioral sets and their components can thus be arranged in a temporal and analytical order, resulting in a rather complex system in which each element is related to specific aspects of the social environment. In order to change behavior patterns, then, a large number of determinants must be analyzed and, if necessary, altered -- not only in the social environment but also in associated behavior patterns.

As has been indicated in earlier chapters, a large number of prerequisites of development have been suggested by investigators in the different social sciences. One behavior pattern that has been generally recognized as a prerequisite -- saving -- will now be analyzed in detail to illustrate the large number of "ties" which relate this rather complicated activity to other activities and to the social environment itself. The activity of saving has been selected mainly because it is a crucial element of economic development and because it is often absent in underdeveloped countries.

The saving set. The most important action element of this set is the putting aside of goods, money or its equivalents -- that is, keeping them (in a variety of ways) and not consuming them or exchanging them for goods which are consumed. This usually means that basic necessities have been met, and that any continuing deprivations are moderate enough so as not to endanger the continued existence of the individual or his family. Basic necessities and moderate deprivation may be defined in terms of physiological requirements or cultural criteria, and thus may be expected to vary somewhat from one community or individual to another.

Saving involves, in addition, limited obligations to others and the absence of aversive consequences to not spending all of one's income. As

an alternative, there should be mechanisms for avoiding or escaping the aversive consequences of saving, for example through great secrecy.¹ Here it should be remembered that the limits of a person's obligations to others are defined by his and others' overt actions rather than by the theoretical standards which may be verbally expressed but largely ineffectual in the community. This is true even though the interpretation of overt actions is often a matter of community standards. The reinforcement of saving is another element of this set. The rewards may consist of either the avoidance of future deprivations (real or imagined) or the promise or probability of future gains. Which of these contingencies operates at any one time depends on the person's perception of the nature of the social system and his place in it, both of which may be related to his formal educational experiences.

While saving is an activity which can be expressed in various forms, it is closely allied with subsequent actions such as hoarding and investing. The choice of alternatives (e.g. burying coins or lending them at interest) depends on several factors which not only affect saving itself but other sets as well, for example hard work, "intelligent" voting, and working in factories instead of insisting on an agricultural way of life. The four most important additional factors are various aspects of individuals' perceptions which are important when the operation of the social context is unknown or unclear:

1. Conception of a lawful universe. This element refers to a person's belief that the various components of a society operate systematically, will continue to do so, and that their future operation can therefore be predicted. This means that it is possible to influence the operation of some elements

¹Manning Nash, "Capital, Saving and Credit in a Guatemalan and a Mexican Indian Peasant Society," in Firth and Yamey, op. cit.

205

in the environment in order to correct the errors which might occur in certain parts of the system, e.g. the use of the judicial system to rectify injustice.

2. Future-time or long-time perspective. The ability to postpone present benefits for future ones is related to a conception of a lawful universe, since future rewards must be predictable. This ability is an important factor in establishing behavioral prerequisites for development since many reinforcers lie in a somewhat distant future.

3. Predictability of others' actions. The specific application of the foregoing to the immediate social context of the individual must be noted, for many activities depend on the accurate prediction of other people's reactions to one's own (or others') behavior and the possibility of controlling the actions of others. Such control is exerted mainly by the presentation of discriminative stimuli appropriate to the situation, e.g. the threat of court action to force the payment of debts.

4. Rational decision-making. This element refers to the making of choices after all relevant alternatives have been evaluated according to their actual consequences. Such choices are based on the ability to sum the actual costs and rewards of each alternative and imply that the individual will act on the basis of this sum.¹ The summation, in turn, presupposes the individual's ability to predict the operation of the social system and the behavior of others, and implies that any variation which might affect the sum will be minor, within known limits. Formal education provides a mechanism for the wider distribution of such knowledge.

¹Simon, op. cit.

226

Rationality, however, is a cultural as well as intellectual phenomenon, for the elements included in the various alternatives have cultural values attached to them and the sum of costs and rewards is evaluated on the basis of cultural criteria. A choice which some men consider rational, perhaps on the basis of ignorance concerning some alternatives, others may deem irrational because they know more of the relevant facts, are more familiar with the social context, or are aware of the actual contingencies of the various alternatives. What is meant by rational decision-making, then, is that men take into account relevant variables and operating contingencies, and that the sum is evaluated on the basis of accurate knowledge and objective criteria -- which may still have a cultural base -- rather than imaginary characteristics of reality. Education may thus be expected to increase an individual's ability to make rational decisions through the distribution of knowledge about operating contingencies.

In summary, a man will save and invest if he can be reasonably certain of rewards within the foreseeable future -- on the basis of his conception of the world and the predictability of others' actions. Whatever he does, it will be the result of his evaluation of various contingencies attached to the alternatives confronting him -- his beliefs, the values he attaches to certain rewards, etc.

All of the elements of the saving set must be present if saving is to occur, and no prediction concerning saving is possible if only a few elements exist. A peasant may be able to predict accurately the behavior of others, but this alone will not lead to saving; what if he can predict that other villagers will be resentful if he does not spend money on a fiesta? Saving is possible only when the set is complete. The fact that some elements of this set are also members of other sets (e.g. that of hard work) indicates

207

that it will be difficult to establish the saving set by itself, and that concerted efforts to establish a number of sets simultaneously may be advisable,

The Determinants of Behavioral Sets

The major determinants of specific behavior patterns may be considered as falling into two major categories: on the social level, the norms and values of a community or nation affect behavior, and on the individual level a person's actions are influenced by his knowledge of the social system and by his conceptions of discriminative stimuli, contingencies, and the probabilities of their presentation. Societal determinants will be emphasized because they are mainly responsible for individuals' conceptions and beliefs, and because a society's values and norms form the context within which -- and often against which -- educational efforts take place.

Societal determinants. The social context may be considered in terms of two major components, ideal values and operating norms.

1. Ideal values. Sociologists generally use this term to indicate the ultimate ends and goals of a society and thus to some extent of individuals. Conceptions of what the world and universe are like (or should be) have also been subsumed under values, as have individuals' conceptions of what is desirable or worthwhile.

Societal values, by defining the ultimate goals of a society and its members, e.g. national security for the nation or wealth for individuals, create secondary deprivations which affect the shaping and maintenance of behavior. Thus, values determine the theoretical contingencies of men's behavior, i.e. the rewards they should reap and the punishment they should receive for certain actions. Ideal standards of behavior, and thus differential reinforcement, have their source in the values which define,

208

in very general terms, the "good" and "bad" behavior patterns which are part of the definition of what the world is or should be like. Conceptions of the world, especially in terms of ultimate lawfulness or capriciousness, define and to some extent limit the procedures which may be employed in reducing deprivations; in a capricious universe, for example, long-range planning is useless. The schedule of reinforcement is also to some extent a function of values, as when it is the generally shared belief in a society that all of the most important rewards are properly received in heaven. Under such circumstances, behavior termed "irrational" by outsiders may actually be quite rational from the point of view of individuals who share this belief. Societal values, finally, play an important part in determining the "proper" circumstances in which activities are performed and rewarded; "doing nothing" may be reinforced on certain days but will meet disapproval on others, and work with one's hands may be appropriate only for people in certain social positions.

A group's values may be ascertained by the analysis of (sacred) literature, or by asking how people "should" behave under what circumstances, what men "should" work for, what they "should" avoid, what the universe is like, etc. Such values must be considered with caution, however, for the behavior patterns which they theoretically determine may not in reality be normative.¹ Ideal values of honesty and humility, for example, or the idea that hard work leads to success, will be ineffective determinants of action (but may be a source of pressure for change) if men know -- and are daily confronted by the experience -- that honesty does not pay, that the humble are stepped on, and that one can get ahead only through "pull."

¹For an illustration of the difficulties which are involved in the analysis of values, see Milton Singer, "Cultural Values in Indian Economic Development," Annals, May 1956.

-261

While values define the ends and goals in terms of which men should act, and indicate the general procedures which should be employed, much greater importance attaches to the specific prescriptions for actions actually operating in a society, subculture, community, and small group; these are the norms.

2. Operating norms. Norms are generally considered to be the rules which define the behavior patterns expected of individuals in particular circumstances, at specific times. In addition, norms usually indicate the sanctions resulting from compliance and deviance, and thus limit the acceptable deviations.

Norms are the immediate determinants of behavior, for they relate contingencies to men's actions, establish discriminative stimuli, and affect the nature and magnitude of deprivation or saturation. Definitions of "proper" behavior and the associated sanctions are usually derived from societal values, and thus there usually is some correspondence between values and norms. In societies undergoing rapid social change, however, operating norms may not be congruent with ideal values, thus making it difficult to shape behavior since contingencies will not be presented consistently. Under such conditions the transmission of values and norms through education will also encounter difficulties.

Norms are ascertained by observing the behavior of men under various circumstances and by noting the consequences of their actions. Norms are inferred from these observations, and predictions made on the basis of observer-inferred norms are then tested to validate the inferences. Laws may prescribe the equality of men, for example, but if peons on haciendas are exploited, it is this contingency which affects the behavior of Indians,

and thus it is the norm of exploitation and not the law of the Codes that must be included in the analysis of behavior.

In the analysis of behavior, norms are more important than values, for the latter are usually too diffuse or generalized to be of much use in predicting specific behavior. When norms are known, predictions become possible not only for the individuals subjected to them, but also for the investigator. The value of "justice" within a community, for example, will be of little consequence and predictive power if laborers are paid only after several remonstrations with the landowner; with such a norm few men will be willing to work for others, and one can predict that few men will work hard.¹

3. Other components. Institutions, even social structure itself, are parts of the social context which influences behavior. Such larger phenomena, however, affect behavior largely through their constituent norms and thus need not be considered as special elements in the etiology of action. A religion, for example, considered either as a set of ideas or as an institution, influences behavior by setting up specific deprivation conditions (e.g. the possibility of damnation or the uncertainty of the future), rewards and aversive consequences, discriminative stimuli (e.g. other people), and thus general behavior patterns (e.g. loving others as one does oneself).

Individual determinants. From the point of view of the individual, a person's behavior is a function of the previously learned S^D and the perceived similarity between the S^D and the present context, of the perceived reinforcement probabilities, of the present state variables and the

¹Edward C. Banfield, The Moral Basis of a Backward Society, Glencoe: Free Press, 1958.

perceived probability of reducing them, and of the behavior patterns learned in the past. In short, his actions are in accord with the norms as he sees them. An illiterate peasant who knows little of the outside world, who knows only that his peers are suspicious and envious, and who believes that the outside forces affecting his village cannot be predicted and controlled, is likely to act differently than will one who understands the rudimentary principles of government, basic legal resources, the possibilities offered by the outside world, and the motives behind the actions of his peers.¹ Since individuals' conceptions of reinforcement probabilities, perceptions of S^D , etc. are reflections of the operating norms, it is not necessary to study individual determinants when the normative system is known. Only when norms are not known by the researcher need individuals' conceptions be studied.

The role of information. From the above discussion it has become apparent that certain types of information, concerning especially a society's values and norms, reinforcement probabilities, etc., underlie the behavior of men. This information can be gained through experience, various types of communication, and formal education. One means of acquiring information relevant to the shaping of certain behavior patterns -- formal education -- will now be considered in some detail.

The Role of Education

In this section education will be considered rather broadly as one set of procedures employed in the shaping, maintenance, and alteration of

¹Oscar Lewis, in two celebrated books, has provided vivid illustrations of peasants' and slum dwellers' world views. He shows, for example, how the conception of a capricious social system and universe, and the unpredictability of others' actions, arises in the course of daily life, and how a person's behavior is influenced by these elements. Oscar Lewis, The Children of Sanchez, New York: Random House, 1961; and Pedro Martinez, New York: Random House, 1964.

behavior patterns postulated to be prerequisites of development. Although education, in this sense, includes a large variety of activities, methods of instruction, etc., the common element in all of these -- the presentation of information relevant to the shaping of behavior -- justifies the combination of different activities and phenomena under one heading.

While it is true that behavior is greatly affected by contingencies, it would be more accurate to say that it is the information and beliefs concerning contingencies, (e.g. the probability of rewards) which influences the activities of men. Information concerning discriminative stimuli, contingencies, ideal values and operating norms of communities and nations, forms the link, so to speak, between the environment and the behavior of individuals. Education in its major role, the presentation (and hopefully the learning) of information, contributes to the establishment of this link.

When the activities of daily life, and particularly the specialized behavior patterns of individuals, are examined in detail, it becomes apparent that any activity, any behavior chain, is affected by information concerning:

1. the probability with which certain contingencies occur;
2. the connection between specific behavior patterns and specific consequences;
3. the definition and nature of various discriminative stimuli;
4. the nature of various reinforcing and aversive stimuli;
5. the nature of various secondary deprivations;
6. the possible procedures for the reduction of deprivations, and thus
7. the definition of "desirable" activities and "proper" procedures.

Information concerning the present, future, and past characteristics of each of these elements also influences behavior, and it may be postulated that the individual takes into account all three perspectives. The behavior

exhibited at any moment, then, is affected by events of the past, predictions of the future, and the evaluation of the present situation in terms of past experiences. Thus, any behavior pattern is part of a closed information loop, and education is one aspect of the feedback system.

Information in these seven areas -- or twenty-one if the time perspective is included -- comes to the individual in a large variety of ways. Among the most important sources are:

1. the personal experiences of the individual;
2. the directly observed or otherwise known experiences of known, specific others (e.g. actual experiences of specific relatives);
3. the hearsay experiences of unknown others (e.g. what is reported to have happened to some people in another village);
4. historical knowledge -- or, more specifically, events reported to have happened in the past;
5. proverbs, stories, myths, and fairy tales (the "moral" of many stories and tales concerns the probable contingencies of various actions);
6. specific statements concerning a group's or society's ideal values and operating norms (as presented, for example, in formal education).

In terms of the behavioral paradigm (Figure 1), a society's values and norms are inferred by the individual from his experiences, interpretations of history, stories, etc., and he then acts in terms of these inferred regularities. Ideally, the inferences based on sources 1 - 5 coincide with the direct statements of source six, but in ordinary life this is rarely the case. Generally speaking, the first five sources become less reliable in descending

order, but even the last source may contain errors. The major problems encountered in these sources and their utilization are as follows:

1. Since the individual is exposed to all sources, at one time or another, it may be expected that only in small, homogeneous, and static communities would a consistent system of norms become apparent. Especially in underdeveloped nations -- in complex societies with plural cultures¹ -- inconsistencies among sources 1 - 5 may be expected to be great.

2. An almost built-in source of inconsistency is the fact that source six presents, usually, the ideal values of a society, together with those operating norms which, on the national level, roughly correspond to them. Sources 1 - 5, however, are likely to reflect the operating norms of sub-cultures, the local variations of national phenomena in terms of which small communities operate.


3. Values and norms are inferred from sources 1 - 5, but there is no reason to assume that such inferences will always be correct. The major possible errors in the drawing of inferences are:

- a) incorrect interpretations of one's own and others' experiences;
- b) incorrect and inadequate feedback from the environment;
- c) incorrect and inadequate inferences from the available information (which may itself be incorrect).

4. The information from which inferences are drawn may be outdated and incorrect, as in the case of proverbs, myths, etc.

5. Since the gathering of sufficient information and the consequent making of inferences usually takes much time, the lag between the origin of the information and the final utilization of this knowledge in action may

¹Manning Nash, "The Multiple Society in Economic Development: Mexico and Guatemala," American Anthropologist, 59 (4) 1957, pp. 825-833.



make the information inaccurate and the resulting activity inappropriate (as the frugality learned in the '30s is no longer appropriate). Especially in countries where the rate of social change is high, the time lag inherent in the utilization of sources 1 - 5 makes the search for other sources of information imperative.

6. Sources 1 - 5 can only repeat information already present in the social system. Little information can be added, usually, and thus no quick changes can be anticipated.

Because incorrect and inadequate information and inferences often result in "undesirable" or "incorrect" behavior patterns, the search continues for the means of accurately transmitting valid information concerning a society's values and especially its operating norms (or, in some cases, the norms which are to be established). This search is especially important in those countries in which the shaping and maintenance of specific behavior patterns -- such as saving or working in factories -- are considered to be essential for future growth. The search usually leads to formal education.

The Role of Formal Education

The function of schools. The schools' major function in the establishment of behavioral prerequisites is: to provide information concerning new behavior patterns and their associated contingencies. Since these behavior patterns -- i.e. behavioral prerequisites -- are usually not found in the person's home community or are not well developed there, the information provided by schools will reflect national aspirations and ways of doing things rather than those of the village. The function of schools may be considered from two points of view.

216

From the point of view of the society, schools can be the sources of accurate, direct information concerning presently operating norms and the norms which are to be created (as part of the process of development). Hopefully, ideal values, both of the present and of the future (consonant with the aims of development) are also transmitted through schools. In addition, schools can directly contribute to the shaping and maintenance of behavior by establishing new state variables, such as nationalism, cleanliness, popularity, "good" manners, and novel foods. In this way schools contribute to the establishment of "rewards" and "punishment" on the national scale -- an important factor in heterogeneous nations consisting of isolated and culturally diverse communities. Because the activities of ordinary life are to a large degree tied to secondary deprivations, which do not directly threaten the continued existence of the individual, such increased homogeneity of state variables (or goals) is an important aspect of development.

From the point of view of the individual, schools are the source of information which may be used to manipulate the environment. More accurately, the information presented by schools may be used to manipulate other people or the physical environment so as to increase the probability of reinforcement and decrease the probability of punishment. Knowledge and utilization of new agricultural methods may increase production (thereby reinforcing the use of new methods), and knowledge of arithmetic may reduce the probability of being cheated in business transactions (thus reinforcing the acquisition and use of mathematical information). For the individual, the utility of schooling lies in the successful manipulation of the environment, no matter what the criteria of such success may be.

Formal education and especially schools, both as sources of information and means for acquiring it, have major advantages over the other sources listed above:

1. the danger of incorrect information is greatly reduced;
2. the individual's interpretation and misinterpretation of events is greatly reduced;
3. the probability of making incorrect inferences from experience, etc. is reduced;
4. information concerning values and norms is acquired more quickly and more efficiently than by means of inferences from experiences, etc.;
5. information not commonly found in the ordinary life of peasants in underdeveloped countries can be presented. In this way, peasants can be exposed to the national culture;
6. different information concerning contingencies, etc. than is available in everyday life can be presented, and thus behavior patterns may be changed.

From the foregoing analysis it is apparent that schools may be a major obstacle to change if information concerning old behavior patterns, old reinforcers, etc. is presented. Conversely, if new activities are suggested, if new models are provided, if information concerning new behavior patterns and contingencies is made available to students, schools will be an important source of change on the community level and, ultimately, on that of the nation. If schools are to actively contribute to the process of development, they must operate in such a way that the "right" behavior patterns are adequately shaped, that the "correct" reinforcers and state variables are established. The operation of schools, then, must be carefully laid out, and every aspect of school life, every program, every part of the curriculum, must be carefully evaluated, possibly on the basis of the well-established learning principles discussed in previous sections.

The operation of schools. If it is assumed that the major purpose of schools is to help establish behavior patterns which are prerequisites of economic development, and of development in general, such as saving, hard work (especially in factories), political responsibility, etc., the variations in operational procedures are determined by the requirements of the learning principles outlined above. Generally speaking, there are six major aspects of learning which should be regarded as guidelines for the operation of schools.

1. In order for schools to be effective, children must attend them regularly and willingly; ideally, schools should become associated with pleasure and profit. In order to accomplish this goal, the operation of the school should be designed to point out the desirable aspects of school attendance from the point of view of the child. For example, school learning could be related to children's known interests, such as sports or animals. Furthermore, it might be pointed out that schools give children an opportunity to be with their friends and to participate in social activities. Finally, schools can be given a positive image by the provision of obvious rewards, such as free lunches.¹ The profitability of school attendance may be conveyed to students -- and parents -- by indicating the relationship between education and its consequences in modern nations, i.e. vocational opportunities, increased incomes, higher standards of living, and improvements in community life. For some students, the promise of a better understanding of the outside world and man's position in it may serve as a reward for schooling. In this connection a family can be informed that it is more profitable to educate a son than to have him work in the

¹Allan R. Holmberg, "Changing Community Attitudes and Values in Peru," in Richard N. Adams, et al., Social Change in Latin America Today, New York: Harper, 1960.

fields, and that failure in school is not a reflection of the family's position in the community but of the individual's performance. Thus, no peasant need be afraid that his children will be given less attention and poorer grades simply because some students come from "better" families.

The effectiveness of schools is influenced also by the type and content of material that is presented. On the one hand, the presentation of "local" information will catch the interest of students, and on the other hand the creation of a national outlook requires the presentation of "national" and nonlocal material. Although probably all developing nations are giving considerable attention to non-local symbols, information, and ideology in textbooks and school rituals, the degree to which non-local elements should be present in the curriculum is still a matter of question. Generally speaking, the school level strongly affects the degree to which the curriculum is localized, while the underlying principle is that since the school is oriented toward the future it should prepare students to adequately perform the new roles opening up in the developing society.

The strongest case for the use of local materials can be made in primary grades, where local geography, examples in arithmetic, phenomena for science lessons, and folktales, can be used to enrich the curriculum and give meaning to otherwise abstract or incomprehensible information. The initial use of local examples and familiar referents can thus be used to orient children to their expanding environment in terms of both the school and the nation.

Secondary schools will adopt a progressively larger amount of science and the vocational education offered will concentrate on techniques not traditionally practiced. In science local materials can be used and local applications made generously, but the essential attitudes instilled will

have little reference to local life. It is in the humanistic parts of the curriculum that local history and geography can be given due attention, but a growing proportion of non-local material will be introduced as the child proceeds up the school ladder.

In universities the proportion of non-local material will increase in the course of study of the typical student. (It is this obligation that supports the argument for overseas study.) The university, wherever it is found, must accept the obligation to prepare at least a fair proportion of its students to live in the international realm of scholarship. But at the same time universities contain many specialists, and it is to these that a nation will turn for scholarly work on its own history, archaeology, linguistics, folklore. Moreover, in the sciences and professional schools, university specialists will be devoted to applied research, which is by its nature largely concerned with local circumstances.

2. The operation of schools should be designed in such a way that a rather controlled environment is established. In such a controlled environment new discriminative stimuli can be created, and new contingencies can be related to new behavior patterns. If differential reinforcement (the selective rewarding of activities) is the major procedure for the establishment of "desirable" behavior patterns, it must be possible to vary systematically the contingencies in terms of which students act -- and this can be done only in an at least moderately well controlled environment. New contingencies, such as material comforts, approval of school authorities, etc. can be provided by schools and become part of the learning process.

The contingencies offered by schools and education in general can be effective only if they are viewed as rewards by the students, and thus the school must establish, as soon as possible in the educational career of the

221

student, new personal and cultural definitions of deprivation compatible with (and similar to) those on the national level. In short, the school may help create needs and desires which can be met only if men exhibit the behavior patterns which underly development. For example, a student may learn in school that he likes certain (new) types of food, such as ice cream, or he may learn about the existence of various sports, recreational activities, radios, and other objects and activities which cost money. Thus, states of deprivation may be created even though the student's material circumstances remain unaltered.

The new contingencies offered by the school become operational for the student as his conception of the "good life" changes and as he becomes aware of the rewards dispensed by the school. When the student relates these new rewards to his old life, the life of his relatives in the village, he learns that traditional patterns of behavior do not usually result in the kind of income which is provided by work in factories and offices. Thus, the possibility of new rewards may motivate individuals to employ new types of activity.

It is in the controlled environment provided by the school that new non-material deprivations and rewards can be most efficiently established. The creation of new symbols and reference groups -- such as "my country" -- is basically the task of the schools. New "ideal values" which represent the requirements of developing nations rather than the needs of the traditional community can be established by no other institution than the schools.

Although the school does not generally manufacture symbols and slogans for the creation of new ideal values on a societal level, it often has to create symbols and secondary reinforcements, e.g. grades and honors, for the promotion of its own particular objectives. The creation of needs and

c 222

desires to do well in school are also important in the context of development since the individual's willingness to remain in school and study hard will influence the ability of the school to promote any other kinds of behavior desired.

In the free environment of ordinary daily life, these tasks are extremely difficult, and the probability of success is small. When the operation of the environment can be controlled, the task is easier and the chance of success greater. Simple control of the environment is not enough, however; there must be a purpose behind the control, and the major purpose will be discussed next.

3. It was pointed out above that individuals usually act according to their perception of rewards, especially in terms of their predictability. The operation of schools, therefore, should be directed toward the creation of a systematic social context in which individuals are able to predict the behavior of others and contingencies in general. In this way, the conception of a systematically operating social context and universe may be established. It will probably be best to demonstrate the predictability of the universe first, since this can be done more quickly and convincingly. Later, the predictability of social phenomena can be demonstrated as following from the lawful nature of the universe. The systematic operation of the school will be a helpful tool in teaching the latter. The simple presentation of information, demonstrations and observations, and direct experience are the major procedures for teaching the predictability of any phenomenon.

a) Science courses, laboratory experiments, and field trips can be used to demonstrate the lawfulness of many phenomena; that birds come from eggs, that apples and not oranges grow on apple trees, that objects

223'

always fall down. On a more sophisticated level, well-planned science courses can provide the opportunity to observe that rain, floods, erosion, lightning are the results of predictable arrangements of certain natural factors. Demonstrations of the efficacy of medical treatment may be another method of illustrating the predictability of physical and biological phenomena.¹ Finally, the scientific method, critical thinking, and the careful analysis and evaluation of empirical evidence may be taught in the higher grades.

b) The predictability of the social context, and of men's actions can be demonstrated best, perhaps, by the operation of the school itself. If, for example, the rules of the school are reasonable, clearly stated, and always enforced -- by punishment or recognition of law-abiding behavior -- students will probably generalize from this social phenomenon to larger social units (with a little help from teachers). If, conversely, the school operates haphazardly, and if the staff is lackadaisical, this will be taken by most students as just another example of the capriciousness of man. Thus, the school with its regular procedures for giving grades, awarding diplomas, initiating and terminating programs of study, punishing those who break rules and rewarding those who abide by them, is the ideal institution for fostering the view that the behavior of men is systematic and hence predictable.

The predictability of social phenomena outside the school may be demonstrated initially by acquiring information concerning examples of predictability. In most countries, the observation of church activities would provide a good example, as would the behavior of men who are integral parts of firmly established institutions, such as bankers, lawyers and

¹Charles J. Erasmus, Man Takes Control, Minneapolis: University of Minnesota Press, 1961.

224

physicians. Later, students may be taught that individuals who do not live up to their institutional roles will be punished, and that the fear of punishment will serve to stabilize behavior patterns, thus making them predictable. The major problem in this stage will be that many social phenomena in underdeveloped countries are, actually, unpredictable. The taking of bribes, the capricious administration of justice, and the intermittent turmoil in political life, are examples of phenomena which have to be satisfactorily explained so as not to invalidate the principle of predictability of human action.

Direct experience, however, will probably provide the most powerful demonstration of the predictability of social phenomena. Besides the systematic operation of the school, it is possible to devise programs which demonstrate predictability. For example, "saving" and its benefits may be experienced by having bank days once a month. Although the amounts are likely to be small, the actual saving can help instill an understanding of the procedures involved in saving, can demonstrate actual contingencies, and can illustrate predictability by the systematic accrual of interest. The consequent spending of savings will serve as a reinforcer not only of saving but also of behaving in accordance with the principle of predictability.

Perhaps even better direct experiences in saving can be provided through activities which result in less delay of the reward. Good school marks saved up can be rewarded weekly by gold stars, identifying sticker, extra recreational time or other meaningful symbol. The most immediate reward to student behavior is teacher approval either in terms of a smile or a written or voiced comment.

225

4. The operation of the school should be directed also toward the establishment of a long time perspective. This involves the predictability of social phenomena and thus results from the employment of the above procedures. In addition, a long time perspective is created through training and experience, and again it is in a school setting that this can be accomplished best and most easily.

The fact that school attendance, study and hard work usually lead to graduation and occupational mobility demonstrates, within the school context, the efficacy of the long-range point of view. The rewards enjoyed by students in the upper classes who have successfully completed the hard work in lower classes are the sources of the vicarious reinforcement in terms of which lower class students act.¹ Finally, successful graduates who have achieved high positions in the community exemplify the contingencies involved in working for future benefits.

Once a long time perspective has been established through schooling, the role of education in the attainment of such behavior becomes apparent, thus serving as a reinforcer for attendance and study. The "demonstration effect" of officials living in fine mansions and being driven about in big cars has stimulated many youths in post-colonial nations to seek more schooling. Indeed, much of the desire for clerkly positions among youth in the developing areas (changing now under new recognizable incentives in other occupations) stemmed not from a bookish education that offered no "practical" experiences. Rather, youth and their parents will be quick to perceive that those who mastered books sat in authority over those who were

¹Bandura and Walters, op. cit.

experts on things, and in addition enjoyed more of the tangible aspects of the good life, including life in the capital city.

A long time perspective is created and maintained not only by the certainty of rewards, but also by their size. Thus, rewards must be substantial in order to be "visible" across the time lag between the present and their attainment. High positions in government or high status in the city have been rewards offered in the past. Many school and university graduates were not able to reap these rewards, however, since there were fewer positions than applicants. Great care must be taken, therefore, to establish reasonable goals and to define rewards so that they can be attained. Schooling, thus, should not be advertised as the panacea for every person's problems.

5. The operation of schools should emphasize the presentation of models whom students may imitate. Because much of the information presented in schools is of rather abstract character, it is necessary to provide models of action and of rewards with whom children may identify. As Bandura and Walters¹ have shown, the provision of models is an important aspect of effective education, and imitation is a significant component of learning. Especially in the establishment of specific behavior patterns, modeling seems to be more successful and faster than learning through actual experience. Models, in terms of individuals, behavior patterns, and rewards, have to be chosen with care and must be presented in carefully defined situations, since children may otherwise imitate "unwanted" characteristics.

If the models are chosen carefully enough, and if they are presented in the correct sequence, many of the abstract characteristics mentioned above (such as the long-range point-of-view) can be established by means of models

¹Bandura and Walters, op. cit.

showing how individuals' actions result in particular consequences -- the relationship between action and consequence may then be abstracted, perhaps with the help of a teacher, and yield the long-range point-of-view.

6. Since the school is devoted to the establishment of new behavior patterns, its success will depend in large degree on the absence of conflicting demands on students which might reduce the rate of learning. The operation of schools should include, then, provisions for reducing the contaminating influences exerted by the student's family, his old friends, and his home community in general, at least until "new" behavior patterns have been firmly established.

The "contaminating influence" of the family and the old community can usually be reduced in morally acceptable ways. As indicated earlier, schools naturally extend the student's understanding and interest beyond the local scene, and emphasis on new ideas, activities, and possibilities naturally reduces the importance of the past. Furthermore, schools increase the choices open to students -- in terms of jobs, friends, interpretations of social and physical phenomena; consequently the probability is low that the old will be sorely missed. The elimination of conflicting demands involves, therefore, little more than the completion of the process begun when the student entered school.

One obvious answer to the question of how more or less pure environments can be created is the boarding school, which by its very operation greatly reduces the influences of the 'home town' and the family. Another way of reducing the influence of the past is to expose the student to a variety of viewpoints by having children from various social classes, regions, and cultural backgrounds in the same class. Confronted by such

heterogeneity, the individual's faith in the old ideas expressed by his family and home village is challenged and often reduced or modified.

The reduction of parental and kin influences will increase, proportionately, the student's reliance on his teachers. Teachers, who often serve as models, must therefore be selected with great care. If teachers are to serve as role models and sources of identification with the modern world, they must be part of it. If primary education, the only educational level available to large numbers of people in most countries, is to have the desired impact on the modernization of attitudes in developing nations, teachers must share a considerable number of modern values and attitudes themselves. Certainly, this factor should receive some consideration in teacher selection and training.

There are indications that the social levels from which teachers are drawn differ somewhat from country to country. If this is true, the types of information they have acquired and their attitudes should also vary. A study by Silvert and Bonilla suggests that Chilean primary and secondary school teachers in the capital were often the less successful sons and daughters of upper status families.¹ These teachers scored fairly high on acceptance of certain work values associated with development. If, however, they had come from the lower class or from a rural area, would their acceptance of these values have been as great? If teachers are to serve as modern role models, they must identify and be familiar with the modern world; however they also need some identification with and sensitivity to their students' cultural experiences and background. In other words,

¹K. H. Silvert and Frank Bonilla, Education and the Social Meaning of Development: A Preliminary Statement, American Universities Field Staff, Inc., New York, 1961, 320 pp.

teachers must be "marginal men" in a real sense in order to bridge the gap between the traditional and modern sectors of society. Tradition bound teachers cannot have modern reference value for their pupils, and students will fail to accept as models teachers with modern orientations who misunderstand, degrade, or insult them.

These six characteristics of the operation of schools are interrelated, as has been pointed out. The provision of adequate models, absence of conflicting influences, and the systematic operation of the school itself, will contribute to the long-range point-of-view, and this in turn will challenge or provide an alternative to the influences of the student's traditional family.

In the above discussion of the functions and operations of the school, a number of ethical problems have become apparent. Since their solutions influence the very basis of school activities, these problems have to be briefly discussed.

Ethical problems and moral dilemmas. When education is used to assist people in becoming participating members of larger, more developed societies, the question of the educator's moral right to change other people takes on great significance. Phrased in its most romantic (and popular) form, the question is this: "Does a government (or technical assistance worker or international advisory team) have the moral right to change the lives of people (and thereby, perhaps, make them unhappy) by educating them so that they will no longer fit into the wholesome village life but be forced to toil in dark, unhealthy factories, discontented and materialistic?"

The fact that village life in underdeveloped nations usually is no more attractive or healthier than urban life, and that happiness and contentment are essentially subjective elements, does not resolve the problem.

Experience has indicated that cognitive and behavioral changes in individuals are concomitants of technical innovation, regardless of the original intention of the change agent, and that the modernization of nations cannot help but result in the 'modernization' of individuals. Thus, education for a modern life may be viewed as involving less misery and confusion for the individual than the unplanned, haphazard introduction of people into developing nations.

Perhaps the best answer is that a nation's commitment to development answers the question with an unmistakable yes. In other words, those who answer the question negatively thereby deny their nation any type of development.

Since there is no generally agreed-upon answer to this obviously complex problem, it can only be suggested that in programs of directed change the moral questions must be taken seriously and form an element in the planning of change.

Another ethical problem revolves around the fact that education, if it is successful in terms of training people who can successfully enter the developing society, will tend to isolate children from their parents and will alienate the young from the local culture. Is this morally defensible?

The answer would be, again, that the "new" men and women of the developing nations cannot help but be different from, and thus isolated from, the "old" population of the traditional society. It might almost be said that development means alienation from the old way of life and the people who practice it. Thus, commitment to development implies commitment to alienation.¹

¹However, formal education through programs in adult education can help soften the introduction of alien ways.

231.

The third problem that arises is of special concern to educators. The frequently stated goal of education, to "adapt the school to the needs of the community" evidently does not apply in developing nations. But should it? If education is adapted to the needs of a traditional village, and concentrates on the teaching of agricultural methods, for example, it may be engaged in activities contrary to the requirements of the nation. The solution to the problem involves, then, the definition of the frame of reference in terms of which educational goals and procedures will be evaluated. If a nation is committed to development, the frame of reference will be the nation, and thus the schools should be adapted to the needs of the nation.

In summary, the ethical problems and moral dilemmas involved in the planning of change and in the establishment of an efficient educational system must be solved in terms of the very characteristics of the process of development and the requirements of industrialization. Once the goal has been determined, certain parameters of action are automatically defined and can be transgressed only on pain of endangering the goal itself. Those who would argue that no man has the right to alienate others from their culture, to isolate young people from their parents and villages, and to force new behavior patterns on students, thereby deny a nation the possibility of development. The development of nations should be planned by taking into account as many requirements of the goal and ramifications of the necessary procedures implied by the goal as possible.

232.

Some Problems Encountered in Behavioral Change

Education is only one of several procedures which may be used to shape new behavior patterns. Probably the most important alternative is the systematic presentation (or alteration) of contingencies.¹ That is, desired behavior patterns can be shaped by attaching reinforcing contingencies to them and by maintaining this relationship over time. Since daily life presents contingencies in a more or less systematic fashion, the ordinary environment of an individual helps shape and maintain behavior patterns consonant with the social context.

If the information presented by educational efforts fits into the contingencies of daily life, new behavior patterns can be quickly and efficiently shaped. If, conversely, the information presented by education conflicts with that presented by daily life and the social context surrounding the individual at every turn, it will be quite difficult to shape "contrary" or "incompatible" behavior patterns simply through education. The major limitations of education in underdeveloped countries arise from this conflict.

Generally speaking, the effectiveness of educational efforts depends largely on the relationship between the experiences of the individual and the information presented by education. Ideally, experiences and information concerning abstract principles (such as justice) validate each other; principles may be used to explain and predict experiences, and experiences may be taken as indicating the validity of the principles. Among peasants, villagers, and the majority of the population in underdeveloped countries, the experiences of everyday life are the major source of information in

¹Kenneth Weingarten and Francis Mechner, "The Contingency as an Independent Variable of Social Interaction," mimeographed, n.d.

233

terms of which the individual acts. If information presented by other means (such as education) conflicts with these experiences and the interpretations and inferences derived from them, the latter may be expected to triumph, and educational efforts will have little effect.¹

The general limitations of education. Educational efforts in general are affected by the following factors:

1. The discrepancy between everyday experiences (and the deductions and inferences based on them) and the information presented by education. More specifically the effectiveness of education may be expected to vary with:

- a) the magnitude of the discrepancy,
- b) the frequency with which the discrepancy is apparent to a person,
- c) the nature of the discrepancy, including the inconsistencies which may exist within the system of abstract principles itself (e.g. the conflicts among norms, values, etc.),
- d) the importance of the discrepancy, i.e. the various areas of life in which discrepancies are apparent. Information which conflicts with everyday experiences may still be accepted and utilized if the affected part of life is relatively unimportant and if the rewards of utilization are sufficiently high.

Since an individual may misinterpret his experiences, or draw the wrong inferences from them, information presented by education may conflict with the incorrect interpretations rather than with the experience itself. Some discrepancies may be largely imaginary, therefore, and may be explained with relative ease.

¹Erasmus, op. cit.

2. The empirical demonstration (or what passes for this) that information presented by education is invalid or does not apply in a particular situation. Abstract ideas of justice, for example, may clash with empirical evidence (e.g. the nature of justice in a village), or modern medical knowledge may not be as effective as procedures employed by the village's curandera. If there is evidence which demonstrates that certain principles provided by education are not valid, the acceptance of such information will be affected by knowledge as to:

- a) whether the principles are always' false, or only intermittently,
- b) the frequency with which these principles are false, or do not apply, and
- c) the times and circumstances when the principles are valid.

3. The inability of the individual -- or of the teachers or society -- to explain satisfactorily the discrepancy between experience and abstract principles, and to reduce the impact of evidence contrary to such principles.

4. The actual or perceived inability successfully to manipulate the environment. If the utilization of newly presented information is not reinforced, it will be either rejected or not used again. The perceived lack of control over the environment -- i.e. the conception of a capricious universe -- also affects the rate of learning and information utilization.¹

5. The inherent time lag. Although some of the information presented through education is of immediate relevance and can be used within a short period of time to successfully manipulate the environment, thus leading to the immediate reinforcement of the individual's educational efforts, many

¹Melvin Seeman, "Alienation and Social Learning in the Reformatory," American Journal of Sociology, 69 (3) 1963, pp. 270-284; Melvin Seeman and J. W. Evans, "Alienation and Learning in a Hospital Setting," American Sociological Review, 27 (6) 1962, pp. 772-782.

results of education do not become apparent until much time has passed. Therefore, the time between the exhibition of behavior, e.g. learning abstract principles, and its consequent rewards, may be so long that the association between the phenomena is lost. Since, ideally, learning involves the presentation of immediate rewards, secondary rewards (or conditioned reinforcers) may have to be inserted between the educational experience of the individual and the ultimate reinforcement. Generally, basic education (e.g. skills) is more quickly followed by contingencies than is higher and more specialized education. Thus it may be expected that especially in the latter type rewards must be easily visible and quite high, or intermediate rewards, such as honors, ceremonies, etc. must be provided.

The specific limitations of schools. The best criterion for measuring the success of schools in shaping behavioral prerequisites is the degree to which such activities are performed by the schools' graduates. Whether newly-learned activities will be repeated in the free environment depends on a number of factors, the most important of which are:

1. the opportunities for engaging in the new activities, and
2. the contingencies of the new activities, especially the rewards.

If the government of a nation is interested in fostering economic and social development, and thus in establishing the required behavior patterns, it must provide graduates with opportunities to act in newly-learned ways, to utilize their newly-gained knowledge, and it must provide reinforcers for new activities. This does not necessarily mean that the government must be instrumental in providing jobs, but rather that it should provide reinforcers for those who complete their education.

236

"Good schools," run by well-qualified administrators and teachers, and operating in terms of the principles and procedures outlined above, will not be successful in terms of the above criterion if their graduates have no opportunities to show what they have learned and if the nation does not provide rewards for such a showing. Conversely, "mediocre schools," run by mediocre administrators and poor teachers, and without the systematic application of procedures outlined in this chapter, may be quite successful in terms of the above criterion if graduates are given an opportunity to act in newly-learned ways and if these activities are rewarded. The success of schools, thus, depends not only on the procedures employed and the quality of the personnel, but also, and perhaps largely, on the commitment of the nation to development.

The fact that schools can be no more successful than the success "permitted" by the nation is well illustrated by the American Indian who, upon graduation, often no longer fits into the old tribal way of life, yet cannot adjust to the white man's ways either. Often, then, he is a failure in both worlds, and subject to various psychological reactions.¹

The school's organization, administration, and curriculum, the teaching techniques employed and the extra-curricular activities which are available, must be coordinated in such a way as to provide a consistent, systematic, predictable context within which new behavior patterns can be established through differential reinforcement. To the extent to which this type of systematic whole is not established, the probability of shaping new behavior patterns will be low. Here again the nation, especially in terms of the amount of freedom it gives to schools, affects the likely success of schools.

¹For other examples of the shortcoming of schools, missions, etc., see Colin M. Turnbull, The Lonely African, New York: Simon and Schuster, 1962.

237

It may be concluded, then, that the success of schools, and the problems encountered by educational institutions, are a function of the nation's commitment to development; unless the nation provides the right type of social context, the schools can exert at best a moderate influence beyond the teaching of basic cognitive material.

Implications for Action

This chapter has been concerned, so far, with such topics as what should be taught, beyond basic skills, and what influence the social context has on the utilization of information transmitted through education. For the consultant, practitioner, and adviser, there is another question: How can the rate with which information is utilized in everyday life and in specific behavior patterns be increased? Possible answers to this question will conclude this chapter.

The learning principles discussed above are postulated to have cross-cultural validity, and thus the basic educational principles may be expected to be the same in different countries. Specific educational policies may vary, but will probably be quite similar in various underdeveloped nations. The social context provided by the various underdeveloped countries will vary greatly, however, as different paths toward development are followed by each. Since the educational system is so intimately tied to the social context, it will be difficult if not impossible to make specific, concrete suggestions concerning the operation of schools. A successful program in Colombia may be a failure in Indonesia, and thus only a general outline of action can be presented here.

The success of educational efforts (both on the national and local level) can be increased on the basis of the following procedures:

238

1. The discrepancy between everyday experiences and the information presented in education must be reduced. If the discrepancy is due to incorrect interpretations and inferences derived from experiences, correct interpretations must be provided. If the discrepancy is real, and if the environment which gives rise to the discrepancy cannot be changed, additional information on the nature and operation of the environment must be provided to give the individual some perspective. In some cases it may be possible to set up new contingencies in the social context to support the validity of newly presented information.

2. If the discrepancy between experience or other evidence and newly presented information cannot be reduced, it must be explained in a manner satisfactory to the individuals involved, or the frequency with which the discrepancy appears must be reduced. It may be explained, for example, that information concerning national norms may not be applicable in a particular village, but that the rest of the nation, or much of it, operates in terms of these principles.

3. It must be demonstrated that the utilization of newly gained information results in the successful manipulation of the environment; when this does not occur naturally, situations with adequate contingencies will have to be set up deliberately (without being grossly artificial). Since the perceived failure successfully to manipulate the environment is as detrimental to learning as actual failure, an individual's perceptions may have to be ascertained and changed, if necessary. Any failure, whether actual or perceived, must be explained to the satisfaction of the individual involved. It may be indicated, for example, that the failure does not reflect on the validity of the information, but is a result of peculiar times and circumstances.

4. Models whom children might imitate must be carefully designed, and the actions and their consequences associated with the model must be consistent and close enough to the children's present experiences to be believable and real. Since learning is usually polyphasic (several different things may be learned at the same time), the model must be considered as a whole, and all of his actions must be evaluated in terms of contributing to the final goal.

The specific ways in which these procedures are to be implemented will depend on the existing social context. Exact procedures, then, will vary from one village to another, from one culture to the next, even from year to year within the same society. Since the underlying psychological principles operate in all societies, the first -- and major -- task of field workers is to adapt these principles and procedures to specific situations. Accurate knowledge of the social environment, then, is the key to successful educational efforts, and thus ethnological investigations should be the basis of any program of action.

240.

Part III

MEASURING EDUCATIONAL AND SOCIAL DEVELOPMENT

CHAPTER 7

UTILITY OF CROSS NATIONAL STUDIES

In the previous chapters the interdependence of education and certain structural changes and social processes in social development has been explored. The ultimate goal is to find ways of better measuring, at least in a macro way, the contributions of formal education to the development process. In this chapter in order to focus more directly on the problems and techniques of measurement a critical review is attempted of studies which have concentrated on the use of quantifiable indicators of educational and social change. More specifically, an analysis is made of four recent large scale cross national studies and portions of other pertinent studies which use cross-national data. The problems of carrying out such studies are described and an assessment is made of their contributions to the study of education and development and their usefulness to the educational planner.

The following four important cross national studies were selected for analysis:

- (1) Norton Ginsburg, The Atlas of Economic Development,¹
- (2) Arthur S. Banks and Robert B. Textor, A Cross Polity Survey,²
- (3) Theodore Caplow and Kurt Finsterbusch, A Matrix of Modernization,³

¹Norton Ginsburg, Atlas of Economic Development, Chicago: University of Chicago Press, 1961.

²Arthur S. Banks and Robert B. Textor, A Cross Polity Survey, Cambridge, Mass: The M. I. T. Press, 1963.

³Theodore Caplow and Kurt Finsterbusch, A Matrix of Modernization, New York: Columbia University, Bureau of Applied Social Research, 1964.

(4) Bruce M. Russett, et. al., World Handbook of Social and Political Indicators.¹

These are briefly identified and then subjected to comparative analysis on several points pertinent to our purposes.²

The Atlas of Economic Development was published in 1961. The nations of the world are ranked on 48 different variables or characteristics, principally economic, and a map drawn for each showing the areal distribution of various levels of performance. A discussion of the problems involved in using each variable and the significance of its distribution is included as well as a listing of the rank of each country on each characteristic. In a short final section an attempt is made to isolate underlying patterns in the correlations between 43 of the variables using factor analysis. Four dimensions are noted: a technological pattern, a demographic pattern, a size pattern and a pattern which seems to isolate contrasts in income and external relations.

A Cross-Polity Survey was published in 1963. This massive volume consists almost entirely of computer printout of all the statistically meaningful relationships among 194 "finished characteristics" derived from 57 basic characteristics, using data from all nations that were independent as of April 1, 1963. The degree of association for each cross-tabulation is specified verbally in English so that those who have difficulty interpreting numerical data can grasp the substance of the work. Most of the characteristics are political, with a few cultural, economic and demographic

¹Bruce M. Russett, et. al., World Handbook of Political and Social Indicators, New Haven: Yale University Press, 1964.

²Another large-scale cross national study, the results of which have not yet been published, is the Dimensionality of Nations Project at Yale, under the leadership of Rudolph Rummel. Data have been collected on 236 variables, many of which duplicate the four works considered here and many of which deal with cooperative or conflict relations between nations.

243

variables included. Since most characteristics of political and cultural interest cannot be easily quantified, qualitative dichotomous variables were used and pooled expert judgment relied upon to classify countries.

The World Handbook of Political and Social Indicators was published late in 1964. This study, while taking the same basic approach as found in A Cross-Polity Survey, has several unique features. More noneconomic characteristics are included and the discussions of the rationale for and problems in the use of each variable are more extensive. Quantitative characteristics are used and the rankings of the nations on each are presented. A matrix noting the numerical value of all statistically meaningful correlations between the 75 variables is included and considerable space is devoted to types of statistical analysis more sophisticated and possibly more useful than simple correlations. The authors indicate how curvilinear correlations can be calculated to apprise relationships which do not seem on their face to be linear. They further demonstrate how multivariate analysis can be used to determine the relative influence of several variables on another. In a further attempt to increase the utility of their work, the authors group their data so as to build empirical models, thus identifying five stages of political and economic development. By means of these models the authors demonstrate how regional variations in relationship among variables can be isolated and evaluated.

One of the latest attempts at large-scale cross-national statistical analysis is a brief unpublished monograph, "A Matrix of Modernization," made available in 1964. After examining the correlation matrix formed among 77 economic, political and social characteristics the authors develop a "modernization index" composed of three indicators which seem to have the best correlations with the other 74 variables and which are, among other

- 244 -

things, most reliable and valid. This index is then related to various measures of industrial development, urbanization and material welfare. Although the index performs satisfactorily in this matrix it cannot be used to measure rates of modernization within countries because data for two of the component measures, energy consumption per capita and inhabitants per physician, are not available over time for most countries. Therefore the third component of the index, telephones per thousand population is used as the single best indicator of modernization. Among other advantages of this indicator are the following: it exhibits a correlation pattern quite similar to that of the combined index; data for it are available for most countries as far back as 1911; and it is highly reliable, since telephone systems have directories which must be accurate if the system is to function.

In viewing these four studies, two major questions are of ultimate concern. How fruitful are the studies in helping to understand the process of development -- or more particularly the functions of education in this process? And, in what way or under what conditions can they be useful in planning?

Much of the following discussion will be concerned with technical or methodological matters. However, in the final analysis, indicators and statistical techniques for manipulating them can be judged as relatively useful or useless only in relation to the hypotheses being tested or the conception of development involved; that is, in relation to what one wishes to measure. Different indicators and different analytic techniques are valuable for different purposes. To a considerable extent the justification is found in this chapter for the substantive emphasis and the statistical techniques employed in the subsequent chapters.

245

Large scale cross-national studies have two major tasks. They provide comparative information on countries and they statistically describe the relation between the variables utilized. The cross-national studies examined here are analyzed in terms of: reliability, population, coefficient of association, types of series chosen, and empirical models developed. Attention is also given to the technique of factor analysis, even though this was attempted in only one of the four studies, and to the possibility of utilizing other than national data. Finally a few tentative generalizations are made regarding the utility for planners and policy makers of these types of studies.

The Problem of Reliability

Increasingly, analysts of social and economic development are able to use statistical series which are based on more than fifty countries. It is important, therefore, to outline some of the decisions that are made when these series are used. Regardless of the purpose to which the analysis is to be put, once underdeveloped countries are included the problem of the reliability of the data is unavoidable. (Even for more developed countries many series depend on countless estimates.) Most analysts sidestep this problem by accepting at face value the published statistics -- the source for which is frequently the United Nations. This places the responsibility for judging the accuracy of the data on the staff of the United Nations Statistical Office which in most cases simply publishes the figures which the statistical offices of the respective countries supply in answer to a UN questionnaire. For some demographic series the UN indicates whether the figures are relatively complete or incomplete and whether they are based on a census or a survey. But even the estimates of the completeness of an enumeration is supplied by the various national statistical offices.

246

As a result, the analyst is several steps removed from both his data and the information which would enable him to judge its reliability. The common practice, and necessarily so, is to admit that the data are bad, but then to proceed as though they were good. Ginsburg¹ and Russett² go one step beyond this and discuss the reliability of their data. Russett's discussion is more thorough and he estimates the error margins of each series. He even goes so far as to use only those figures that the UN designates as 90 percent complete for his birth, death and infant mortality rate series.

Parenthetically, it might be added that the UN has greatly improved the data in the past few years by standardizing the definitional basis for the various enumerations. Great strides forward have been made, but many series still are almost unusable for comparative purposes. Comparisons of technical competence are particularly suspect; for example, the definition of a physician in one country might be equivalent to that of a third-year medical student in another.

However, that the data employed are frequently inaccurate is not necessarily a good reason, in the case of most series, for suspecting any systematic bias. Nevertheless some measures are more suspect than others and the direction of bias of certain measures may be predictable. For example, a measure of university students enrolled in a science course is likely to be quite accurate, as the number involved is usually small and therefore easy to find and count, whereas a measure of total primary enrollment is frequently quite inaccurate, as the numbers involved are large and

¹Ginsburg, op. cit.

²Russett, op. cit.

the students scattered. Further, in the latter case the error could be either an over- or an under-estimate. Similarly, a measure of national educational expenditure per secondary or university student might be expected to be fairly accurate, while a measure of educational expenditure as a percent of GNP will frequently be an overestimate, since GNP does not take into account the subsistence sector of the economy. If the error is random, then it should depress correlations but not lead to false correlations. Secondly the purposes for using particular data must be considered. If, for example, an estimate of school attendance is needed for practical purposes of administration or as data for comparison with an absolute standard (of nutritional sufficiency for instance) inaccuracy is serious. The error may be less so in data used to rank countries.

Selection of the Population

The second decision that the analyst must make is the choice of population that he will use in his study. Most studies are based on a population of "political entities," which refers to all the political units which have or could have in the future, membership in the UN. The Caplow study,¹ however, confines itself to all political entities having at least five million people.

Frequently, as in the Caplow study, an arbitrary decision is made to eliminate certain nations from the study for the convenience of the researcher. Usually no conceptual basis is offered for excluding nations from a study on the basis of population and often this is done simply because adequate statistics are not available. In the latter case (like the well-known bias of psychological studies in favor of the much studied

¹Caplow, op. cit.

college sophomore) such action might eliminate the very thing being studied since one of the correlates of development is good statistics. Thus one of the correlates of "educational development" is having good educational statistics. There could, however, be several conceptual reasons for deciding on a population. For example, if the concept of development employed includes political and fiscal autonomy, colonial nations would be excluded from consideration. Or, as in the present study, if the definition of development includes certain conditions of social structure and "life styles" the population of a political entity would be irrelevant but the occupational and educational "distribution" of the population would not be.

Another difficulty in the studies in question is the great difference -- on nearly all crude development indicators -- between the West and the rest of the world. The question arises whether, or in what sense, the West is a single culture area from the point of view of social development and thus treating each western nation separately serves to artificially inflate correlations.¹ To eliminate this problem the more underdeveloped countries could be studied separately and the resulting correlations compared with those arrived at when using all of the world's nations.

A sub-problem here is the widespread custom of putting all national data as ratio to population. Many aspects of national life such as political stability, economic growth, and so on, are unrelated as antecedent or consequent to population size. Before using a ratio to this variable it

¹This is, of course, the famous "Galton's Problem"; the problem of correlations which may simply be an artifact of common historical circumstances. See Raoul Narroll and Roy G. D'Andrade, "Two Further Solutions to Galton's Problem," American Anthropologist, 65 (5), October, 1963, pp. 1053-1067.

is necessary first to see if a theoretical or functional relationship exists between population and the component of development being measured.

The Coefficient of Association

A discussion of the choice of coefficient of association can lead to highly technical considerations on the relative merits of particular statistical measures. Yet some consideration of the most commonly used and fairly simple coefficients is in order.

It is relevant to point out that in studies of the type being reviewed in this chapter, dealing as they normally do with total populations rather than with samples from some larger universe, questions of statistical inference, and hence of tests of significance, are largely irrelevant.¹ Coefficients of association in such cases are descriptive statistics, and therefore the relevant problems in evaluating them relate to 1) the effects on the size of the coefficient of particular data patterns, e.g. extreme values or curvilinearity, and 2) the relative gain or loss of information associated with various coefficients in particular situations.

Russett used the Pearson product-moment correlation coefficient. Caplow used the Spearman rank order correlation coefficient, and Banks² used the chi square coefficient of association. The Spearman method required the conversion of scores into ranks. The chi square method required the conversion of quantitative data into dichotomies. This procedure enabled Banks to compute the association between both qualitative

¹Russett points out that tests of significance in such circumstances can perform a useful function in a negative sense, e.g. screening out very weak associations. (See discussion: Chapter 10)

²Banks, op. cit.

250

and quantitative variables. In a related study, Cutright¹ used the Pearson coefficient, but first converted all data to T scores. In this manner, he standardized the means and standard deviations of his series which made the series more comparable.

The Pearson coefficient is the standard method used to measure the degree of association between variables. It is the most precise method, but only if certain conditions obtain. First, it measures only the degree to which two variables are linearly associated -- often indicators of development are not linearly associated. Second, the Pearson correlation is influenced considerably by extreme values.

Caplow used the Spearman rank order correlation, because both weaknesses of the Pearson statistic are somewhat modified when the data are converted to ranks. Using this method extreme values count no more than other values and two ranked series, if related, are linearly related. The Spearman coefficient has an important additional feature that greatly increases its value for cross-national studies with series which have ratios of the highest score to the lowest score that exceeds 100. The variations in the lower quartile for these series have almost no influence on the Pearson coefficient, but do influence the Spearman statistic.

The number of radio receivers per 10,000 population for 1960 illustrates the different effects of the Spearman and Pearson statistics. The series extends from 4 for Yemen to 9749 for the U. S. For simplicity, we will say that the scale on this series goes from 0 to 10,000. In the first decile of the scale (0-1000), 40 countries are bunched together. Only one country, the U. S., is in the top half of the scale. The Pearson correlation

¹Phillips Cutright, "National Political Development: Measurement and Analysis," American Sociological Review, 28 (2), April, 1963.

251.

might be more affected by the presence or absence of the U. S. in the sample than by the presence or absence of perhaps 30 of the countries in the first decile of the scale. The Spearman statistic ranks the U. S. as one, and Canada, with 4495 receivers per 10,000 population, as two, and is no more affected by the U. S. than it is by Yemen. On the one hand, a researcher might not want the U. S. to have as much influence on the correlation as the Pearson statistic would give it. On the other hand, a researcher might not want to treat the jump from Canada's 4495 receivers to the U. S.'s 9749 receivers as having the same importance as the jump from Yemen's 4 to Sweden's 9. Other options are available, such as using the Pearson statistic with logarithmic conversions which treat equal ratios with equal importance. Research goals must, in the final analysis, be the deciding factor.

A weakness of the Spearman method is that some distortion is involved when data are converted into ranks. Perhaps the conversion process reduces too much the influence of extreme values; or perhaps these extremes are too important to be given the same weight as every other score.

Banks could not use the above procedures, because he wanted to use qualitative variables. His choice of the chi square was unfortunate, however, because one chi square coefficient cannot be compared with another measure of association unless both are based on the same sample size. Since the sample size of his series varied, another method, such as the Q coefficient of association, would have given results that could be compared.

One might assume that transforming quantitative series into dichotomies is a wasteful use of the data. Two arguments, however, can be made in favor of this procedure. The level of sophistication of the mathematical procedures should be appropriate to the accuracy of the data. Dichotomies

252

are appropriate for the crude data with which cross-national studies work. The second argument is the fact that multivariate analysis is most easily carried out on dichotomized variables.

Another statistic, not used in any of these studies, but which is worthy of special consideration, is Kendall's Tau. It is a rank order statistic, but it has several distinct advantages over the more commonly used Spearman coefficient: 1) it is far easier to compute; 2) its sampling distribution approaches normality for N s as small as 10, so tests of significance can be more easily applied; 3) it has a more meaningful interpretation as a descriptive statistic.

This last point needs amplification. When both variables are ranked, the classical theory of linear regression, upon which correlation coefficients are based, is not applicable (for example, the square of a random order statistic cannot be interpreted as proportion of variance accounted for in the underlying variables¹). The Spearman coefficient, however, is a correlation coefficient, treating the ranks of subjects as though they were scores, and is thus meaningful only by a rather spurious analogy with the standard correlation coefficient.² Kendall's Tau on the other hand is not a correlation coefficient. It measures directly the degree of "agreement" or association between two rankings. Essentially it expresses the difference between two proportions: 1) the proportion of pairs of individuals having the same relative order in both rankings; and 2) the proportion of pairs of individuals having different relative order in the two rankings.³

¹William L. Hays, Statistics for Psychologists, New York: Holt, Rinehart and Winston, 1963, p. 642.

²Ibid., p. 651.

³For a further discussion of this point see Chapter 9.

Kendall's Tau thus measures directly what scholars of development might be interested in: the extent to which two rank orderings tend to be similar. In a quite practical vein this means that the Spearman coefficient, taking account only of the magnitude of differences between ranks, can be very high if there are only a few large differences in ranking, while Kendall's Tau, taking account only of proportions of difference, will be high if there are a large number of quite small differences. Tau is thus quite sensitive to those small but possibly highly significant differences between quite underdeveloped countries .

One serious weakness of Kendall's Tau is that its interpretation becomes considerably less straightforward when there are ties in either ranking. A closely-related measure of association which avoids this problem is Goodman and Kruskal's Gamma.¹ The Gamma coefficient has not been widely used in any large-scale cross-national study, but should be carefully considered if many tied rankings are expected to occur in the data.²

Factor Analysis

Will a factor analysis produce new insights into the study of modernization? Probably not, though it may be worth a try. The Atlas of Economic Development is the only study which factor analyzed the correlations between variables, and the unproductiveness of this factor analysis

¹Leo A. Goodman and William H. Kruskal, "Measures of Association for Cross-Classification," Journal of the American Statistical Association, 49, Dec., 1954, pp. 747-754; Leo A. Goodman, "On the Statistical Analysis of Mobility Tables," American Journal of Sociology, 70, March, 1965; cf. also, Hays, p. 655.

²For further discussion of statistical measures, see Goodman and Kruskal, Ibid. Attention is also drawn to a discussion of measures of association for ordinal variables in Herbert L. Costner, "Criteria for Measures of Association," American Sociological Review, June, 1965.

suggests that factor analysis may not be too helpful. In this study four dimensions (or factors) were found within the forty-three variables, but it is not known what these factors are. The first one "summarizes an extremely strong average effect present in all 43 indices."¹ This factor was called the "technological scale" since variables involving modern technology had the most effect on it.

The second factor is more of a mystery. The seven indices which have the most effect on the second dimension, in order of importance are: infant mortality rate, crude birth rate, crude death rate, population growth rate, rice yields, plus two negatively associated variables: trade with the North Atlantic Region, and telephones per capita. The importance of the mortality, birth, and growth rates provide some justification for calling this series a demographic scale. However, the important influence on this factor of series like telephones per capita makes this title questionable.

The third factor is inscrutable. The eight most important indicators for this factor, in order of importance, are: population growth rate, crude birth rate, energy consumption, foreign trade per capita, freight ton-km. per km. of railroad, national product, motor vehicles per unit of road, and motor vehicles per capita. After the distribution of countries on this factor is examined the factor is interpreted as revealing "contrasts in national income and external relations."² Such a conclusion is convincing only if the reader looks at the distribution of countries and forgets the variables most involved.

¹Ginsburg, op. cit., p. 113.

²Ibid., p. 116.

The five most important indices for the fourth factor are: population density, energy reserves in kwh per capita, energy reserves in kwh, percentage of land cultivated, and population per unit of cultivated land. On each of these variables countries with large tracts of uncultivated land would score differently than countries which lack mountains and wastelands.

What has this factor analysis produced? It has given us a technological scale, a demographic scale, a mystery factor, and a size factor. The technological scale and the demographic scale are closely associated as a scatter diagram demonstrates. They probably are two variations on the same theme. One could call this theme development (or perhaps modernization) and say that it has technological and demographic aspects. (Social and political aspects could be added, but Ginsburg's variables do not cover political variables and his social variables are included in the technological factor.) The size factor is a statistical artifact. It does not have a role in development, but it does have a role in the indices of development. Series are standardized either by dividing by the population or by the area. Either of these procedures introduces some bias which is picked up in this fourth factor. In sum, then, the computer tells us that the 43 variables deal with some social process which has technological and demographic aspects; that size is a factor to be considered, because it affects some indicators more than others; and that something else is going on that we cannot figure out yet.

The above criticism does not mean that factor analysis should not be attempted in other studies. Ginsburg used mainly industrial, transportation, agricultural, educational, and demographic variables. A study that uses political, psychological, and cultural variables might find some interesting

256

results. At the moment, the important factors to discover are these that are not related to development but are related to the rate of development.

Types of Series Chosen

Quantitative series. Basic to every study is the choice of concepts and indicators. Because of the efforts of the UN, an analyst has a large number of quantitative series from which to choose his indicators.¹ Not all of these series will be discussed in this paper; rather, attention will be focused on a sample of the series which analysts have judged important enough to include in a study. Reference will primarily be made to the four large scale, cross-national comparative studies by Ginsburg, Banks, Caplow, and Russett, but discussion will be limited to education series.

Education series. In these four major cross-national studies education has been represented by three types of series: 1) literacy rates; 2) enrollment ratios; and 3) primary and secondary teachers per 1000 population. Five different enrollment ratios were used: 1) primary school enrollment as percentage of age 5-14 population; 2) secondary school enrollment as percentage of age 15-19 population; 3) primary and secondary school enrollment as percentage of age 5-19 population; 4) post-primary school enrollment as percentage of total population.²

¹For a list of indicators and their sources, see the UN Statistical Office's "List of Statistical Series Collected by International Organizations," Statistical Papers, Series M, No. 11, Rev. 1. In addition to worldwide information, additional data is often available from such special sources as the Pan-American Union or the Economic Commission for Asia, Africa or Latin America.

²Sometimes an index is used which is composed of several raw sets of data added together, or divided, with logarithms, etc., and it defies common sense to know what really has entered into any resultant correlation. Here as elsewhere, for prediction, summing many variables may increase predictability; summing variables never increases explanation. It is better to keep the sets of data separate and examine their separate or joint effects through the customary methods of multivariate analysis.

257

Literacy rate is the only series that was used in all four studies being reviewed.¹ This is somewhat surprising, since there are several disadvantages to literacy rates. For the majority of countries, the most recent literacy rates are for 1950 or earlier, definitions of literacy vary widely, and it is a series that cannot differentiate among advanced countries. Therefore, literacy rates are not a particularly useful indicator when the universe contains a number of developed countries.

One advantage of the literacy series is the fact that literacy data are collected through a census or a survey. Most educational series are compiled from figures reported by schools. If the educational data are derived from two independent sources their value is therefore increased -- if, of course, the series from the two sources are both understood as measures of the same basic variable.

Enrollment ratios are troublesome statistics with which to work. The categories in which the data are reported vary from country to country. Primary school varies from 4 years (as in Burma) to 9 years (as in Czechoslovakia). Secondary school varies from 4 years (as in Hungary) to 9 years (as in Austria). Furthermore enrollment statistics are not adjusted for amount of attendance. High dropout rates in underdeveloped countries and varying lengths of school years greatly reduce the comparative value of these statistics. Additional errors are introduced when enrollment figures are changed to enrollment ratios by dividing by the population of the appropriate age group. In so doing, comparability is increased, but

¹It is also central to the analysis of C. A. Anderson and M. J. Bowman, "Concerning the Role of Education in Development," in C. Geertz, ed., Old Societies and New States, New York: The Free Press, 1963; and Daniel Lerner, The Passing of Traditional Society, New York: The Free Press, 1958.

258

the reliability is decreased since age specific population figures are often worse than the enrollment figures.

The objections to enrollment data do not end here. These data ignore the quality and content of the education; they give equal weight to engineering and religion. For many countries the content of education can be taken into consideration only at the university level. Add to this the fact that one cannot tell how complete or honest the reporting is, and it must be conceded that enrollment ratios are very unsatisfactory.

This raises the question of whether bad data, since they can be misleading, are worse than no data. In the context of cross-national studies the answer usually is "no." The various countries are stretched out so thinly along the vast continuum of modernization that for most series even bad data will put each country into the right section of the continuum. Among underdeveloped countries, where the errors would be the greatest, an error of 100 percent would not greatly alter the relative rank of a country. On the basis of dubious data, therefore, countries can be classified with relative accuracy into four or five educational categories.

The teacher series has fewer problems than literacy or enrollment ratios. Enumerations should be fairly accurate (except for the omission in some countries of private and missionary schools). Two problems, however, afflict the series. The inclusion or exclusion of part-time teachers in the enumeration makes a substantial difference in the total. In underdeveloped countries teachers may have only a primary school education, therefore the quality, e.g. professional level, of teachers would not be consistent throughout the series.

Three additional education series were used in a study by Harbison and Myers. Two series were used to indicate the orientation of higher education:

259

percentage enrolled in science and technology and percentage enrolled in humanities, law, and arts. The authors used expenditures on education as percentage of national income for a "rough measure of the degree of the direct financial commitment to public education."¹ The Harbison and Myers series are not associated with level of development because the denominator in each case is highly related to the concept of development implied by the authors. (It would be interesting to see if they are related to rate of development.) The numerator alone or the numerator divided by a neutral denominator like population would be correlated with development.

Harbison and Myers used three series to indicate the stock of high-level manpower; primary and secondary school teachers, engineers and scientists, and doctors and dentists per thousand population. When educational attainment figures are unavailable, these series together could substitute as an indicator of the educational level of the population. Perhaps it would be useful to construct an index from these series using the ratios between the series to derive weights for them.

The above series do not exhaust the available education series. Percentage distribution of the population 25 years and over, by educational attainment and sex, is reported in the UNESCO Statistical Yearbook 1963 for a large number of countries. This publication postdates the studies under discussion and series derived from this data have not yet been used in large scale cross-national studies.

Three additional types of education series deserve consideration. The first type is ratios between educational levels which can be computed using either enrollment or educational attainment figures. The ratio of

¹Frederick Harbison and Charles A. Myers, Education, Manpower and Economic Growth, New York: McGraw Hall, 1964, p. 35.

260

higher education to primary, of higher to secondary, and of secondary plus higher to primary could be computed to indicate the degree of "elite" or "mass" education. For three or four stages of modernization a typical pattern could be computed and compared to the patterns of the countries in the same stage. Thereby countries could be classified as top heavy, bottom heavy, or middle heavy for their level of modernization.

The second type is the percentage female series. Both the percentages of total female population involved in education and the percentage of those involved who are female are important, though for different reasons. The former may reflect a variety of societal characteristics ranging from occupational structure to differential sex roles. The latter may also reflect these factors but in addition is affected by school policies of selection and promotion, individual motivation and so on. Female education may or may not be of importance for manpower needs, but it may well be of major importance for the value and personality characteristics of the society. E. E. Hagen¹ argues that the key to social change is family rearing practices with mothers playing the major role. McClelland² likewise argues that feminism is crucial for developing a society with a larger proportion of individuals with high need-achievement.

Percentage of teachers that are female can also be a useful statistic. If used judiciously and with cognizance of special national conditions, it may be considered an indicator of the prestige level of the teaching profession in various countries. For example, a large percentage of female

¹Everett E. Hagen, On the Theory of Social Change: How Economic Growth Begins, Homewood, Ill.: The Dorsey Press, 1962.

²Robert W. Burns, ed., Education and the Development of Nations, Syracuse: Syracuse University Press, 1963.

261

teachers can indicate that teaching as an occupation has relatively low prestige (although it may at the same time indicate a relatively high prestige for women).

The third type is the student-teacher ratio which is one indicator of educational quality. The problem with the students per teacher series is its reliability. Substantial errors in enrollment figures would greatly affect this series even though the same errors do not invalidate the students per 1000 population series. The reason is the range of the two series. On students per teacher in primary school, countries are concentrated between 25 and 40. If errors changed a country's score from 28 to 33, it would be down-ranked about 20 ranks. The same enrollment error would cause about a 5 rank down-shift on the enrollment in primary school as a percentage of the age 5-14 population series, because on this series countries are spread out from 3 percent to 100 percent.

It must be borne in mind that the utility of a measure can only be judged from the point of view of the concept which one is trying to measure. This can be offered as a general criticism of most categories of series, including education. Indeed, the very categories typically used in studies such as those being reviewed -- education, transportation, communication are common sense categories with no apparent conceptual justification. If, for example, one asks to what extent a country is "integrated" then one needs to know not only rail miles per capita or per mile but the spread of the system; one needs to know not only telephones per capita but also telephones per city or long distance calls as the proportion of total calls.

In other words the statistical series frequently used do not adequately measure the spread of the variable or even tell if the distribution

262

might be bi-modal. This limitation may mean, for example, that what passes for "development" referring to an entire nation is concentrated in large cities and should more properly be labeled "urbanization" or "large-scale urbanization." Calories, doctors, telephones, water systems, housing, schools, etc., are all concentrated in cities in many countries of the world. The high correlations among them are probably a result of their all relating to a common cause or source which is something less or different than national development.

Qualitative series. The widespread zeal for quantitative measures of characteristics of nations is laudable provided it does not lead to scorn for qualitative societal indicators. Most of the best work to date in sociology deals with qualitative variables which measure attributes of individuals. In like manner, qualitative variables which measure attributes of countries can be invaluable to the study of development. For one thing, some of the crucial factors cannot be quantified; they will be lost to the analysis unless qualitative series are included.

One important reason for using the cruder qualitative series which is often overlooked is that they facilitate multivariate analysis. Multivariate analysis is possible with quantitative series but it is more difficult. The time is close at hand, however, when multivariate analysis can be done easily with both types of variables.

In the four major cross-national studies to date, qualitative and quantitative variables have not been mixed. Ginsburg, Russett, and Caplow used only quantitative variables and Banks used only qualitative variables. Sometimes Banks' variables were derived from quantitative variables. The reason seems to be that each author was seeking a correlation matrix which

263.

required the use of a uniform correlation technique. A study which is guided by specific questions rather than specific techniques should use all the pertinent variables and all the appropriate techniques.

In this chapter no attempt will be made to review and evaluate Banks' series. Rather, several general remarks will be made about his procedures. He is to be commended for his use of the impartial panel of experts to classify countries on qualitative variables. This method reduced the subjectiveness of his scores. He deserves even greater praise for publishing in full the lists of countries in each category. The reader can then judge the judges. Another study might not be able to afford a panel of judges, but it must show how it judged each country, if the study is to be taken seriously.

One complaint should be registered against Banks' procedures. He made an unhappy choice of a statistical measure of association. Chi square coefficients are not comparable unless based on the same sample size (a condition which was not fulfilled by his data). A correlation coefficient which varied from -1 to +1 should have been chosen for comparability. The use of the Fisher test of significance cannot compensate for this weakness of the chi square coefficient.

Time series. The dream of all empirically oriented students of social change is to have good time series with which to work. Conclusions about the relations between variables based only on cross-sectional data are shaky, but alternatives do not seem to be available yet. Time data are scarce and many problems impede deriving firm conclusions from them.

Only Caplow and Russett include time series in their studies. Caplow's time series are percentage rates of increase for telephones, energy, steel,

communication, and transportation series. They cover approximately the decade period from 1950 to 1960. Russett uses seven rates of increase series: annual percentage rate of increase in population, 1958-1961; average annual increase of percentage of population in cities of over 20,000 for a variable period (1921 to 1961 for Canada and 1950 to 1957 for Nicaragua); average annual increase of radios per 1,000 population, 1948 to 1961, annual percent increase of GNP per capita, 1948 to 1960, annual change in percent employed in agriculture, 1930 to 1960, annual percentage rate of change of inhabitants per hospital bed, 1951 to 1960, and average annual increase of percentage of population aged 15 and over literate, for a variable period (1920 to 1960 for Hungary and 1946 to 1953 for Ceylon).

It is unfortunate that Russett's series have very little in common. One is a three year series, three are decade series, one covers thirty years and two cover forty years. The longer series have a wide range of initial and terminal years for different countries. Furthermore, some series are percent increases and others are absolute increases. Some are changes in percentages, some are changes in per capita series, and others are increases in gross quantities. As a result, these series are incomparable in terms of substitutability of rankings or even in terms of grouping countries as "high," "low," etc. This lack of comparability does not, however, preclude bivariate or multivariate analysis of relationships between, for example, changes in percentages and increases in gross quantities.

The above illustrates the confusion that time series can cause. Some extended comments, therefore, are in order on this problem. In the sections that follow, five subjects will be covered. First, the available data will be briefly summarized. Second, three methods of scoring increase series will be criticized. Third, types of series will be described and compared.

265

Fourth, the statistical problems in using time series will be discussed, and, fifth, the use of cross-sectional data to substitute for time series will be evaluated.

1. Available Data for Time Series.

The data for quality time series should be periodically available, i.e., every year, every five years, or every ten years; and the increase or percent increase should be computed for each period. In the beginning stage of a study, however, it is easier to compute average annual increase by subtracting the initial figure from the terminal figure and dividing by the number of intervening years. Russett used this procedure even in his published work. There are two advantages to it. It is quicker and it allows the use of series for which periodic data is unavailable.

The series which are available for a long time period, i.e., 30-40 years, and for most of the countries are: telephones, electricity consumption, energy consumption, production series, and transportation series. Demographic series, i.e., birth rate, death rate, and rate of natural increase, are available for a long time period, but for fewer countries. Given the definition of development employed in this study which includes a certain "lifestyle" of the above, the production series are not as valuable as consumption figures for indicating the development of societies. Left then are telephones, electricity, energy and six or seven transport series. Not much of a story can be told on the basis of only these.

Today people usually discuss growth in terms of GNP, but the concept of GNP did not come into widespread use until the late thirties or forties. Scholars, therefore, have had to estimate the GNP of the National Income retroactively for earlier years. It seems that Woytinsky's set of 1938

- 266 -

NI figures¹ are the earliest comparative NI figures for a large number of countries. Kuznetz' works² contain GNP growth series for longer periods but for fewer countries. Colin Clark's careful work³ on comparative national wealth statistics gives the most complete set of national wealth time series available in one source. But even when every stone is turned in search of national wealth time data, the results will include very few underdeveloped countries.

Scarcity of early figures is only one of the problems with using changes in GNP per capita to indicate the rate of progress of a country. Improving data collection may exaggerate the rate of increase, since income is being counted in the later period that slipped through the statistical nets of the earlier period. This is especially true of the income of the subsistence sector, for sometimes the goods that are produced and consumed in the same family are never incorporated into the GNP. The growth rates of semideveloped and underdeveloped countries, therefore, tend to have inflated GNP growth rates.

Short term rates of change, i.e., about ten years, are a different matter. Data are available for many countries on many series. The 1954 and 1964 statistical yearbooks of the United Nations, for example, can be compared for many short-term change series. The problem with short-term series is the fact that a one or two year shift in year base can have an

¹Wladimir S. and E. S. Woytinsky, World Population and Production, New York: Twentieth Century Fund, 1953.

²Simon Kuznetz, "Quantitative Aspects of the Economic Growth of Nations," Economic Development and Cultural Change, V (1), Oct., 1956.

³Colin Clark, The Condition of Economic Progress, 3rd edit., London: Macmillan, 1957.

immense effect on the series. It is important with short-term series, therefore, for all countries to have the same initial and terminal dates.

2. Methods for scoring time series.

There are several ways to compute time series and each gives different results, none of which are completely satisfactory. The aim of time series is to tell us which countries are doing well and which are doing badly. Each method, however, measures a different type of progress, and each method gives high scores to a different set of countries.

The first method is to measure and compare absolute increases. Russett's annual increase in radios per capita is an example. Usually, this type of series is highly correlated with the cross-sectional series. For example the country with 500 radios per 1000 people could easily add 50-100 radios per 1000 population in ten years. But the country with only 5 radios per 1000 people has to double its number of radios to only add 5 radios per 1000 population in ten years. This type of series is most useful for purposes of analyzing comparative growth when the cross-sectional series for the same factor has a narrow range. Otherwise, percent increase rather than absolute increase should be used so that the rates of change can be compared.

Percent increase is the second type of time series.¹ The increase in a variable is standardized to a percent increase by dividing by the starting level. Probably this is the best simple method of measuring progress in that it measures relative growth, standardizing for starting levels, rather than absolute growth. A weakness of the method is that it usually interjects

¹Another possibility is to study the change in ranking of nations over time in order to judge the comparative "improvement" of a particular nation.

the opposite bias to what the absolute increase introduced. Percent increase series usually favor the underdeveloped countries whereas the absolute increase series favors the developed countries. The country with very few radios needs to add only a few radios to have a 100 percent increase. The data suggest that it is easier for a country to double its score if it starts with a low score. This method, also, therefore, is more impartial in studying growth when the range of the companion cross-sectional series is narrow. But, unfortunately, most of the series related to development have large ranges, thus making both of the above methods unsatisfactory.

McClelland¹ attempted to go between the two horns of the dilemma by using absolute increases but trying to remove its bias for developed countries. This was done by computing the regression line between the initial level and the absolute gain. This line indicates the predicted gain for each starting level. By subtracting the predicted gain from the actual gain, countries were quantitatively scored in their degree of over or under-achieving. Increases were not scored, therefore, in terms of absolute or percentage increases, but in terms of standard deviations from a regression line.

Unfortunately, McClelland's method was only partially successful and the problem remains to bother us again. By his scoring method underdeveloped countries will be moderate over- and under-achievers and only developed countries will be big successes and big failures. For the type of variables involved in development the variations around the regression line will form the pattern of a cone with the regression line as its axis. The

¹David C. McClelland, The Achieving Society, Princeton: Van Nostrand, 1961, pp. 87-89.

large end of the cone represents the variation of the developed countries. Therefore, an over-achievement of .5 standard deviations for a highly developed country should be considered as a little better than average performance. A score of .3 standard deviations at the other end of the scale should be considered as an astronomical success. So, once again, accurate information on how well countries are doing is not forthcoming. Thus the fact that they over- or under-achieve is accurately told but not how well or how badly they over- or under-achieve.

It is interesting to note that McClelland's method also is more reliable when the range of the companion cross-sectional series is narrow. Oddly enough, a narrow range is a mixed blessing for McClelland's method. It will lower the correlation between the absolute increase and the initial level. But a lower correlation makes the regression line less meaningful, i.e., it is the "best fit" line, but other lines would fit almost as well.

One partial solution to these problems is to subdivide the countries into sets of countries which define one kind of human community (see Chapter 1). These sets of countries then form a legitimate population, even for variables like time series. Progress can then be measured by any of the above methods, but the progress scores should only be compared to the scores of other countries in the same subset. The mean progress score for each subset can then be computed and compared. In this manner one can say that Yemen is doing very well or very badly on factor "x", relative to other countries in its group and that countries in one group in general tend to do very well or very badly on factor "x", relative to other groups. If one still has an urge to compare the U.S. and Yemen, he could rank the progress performances in each subset (assuming the subsets are of equal size), and

say the U. S. was the " i^{th} " best performer, whereas Yemen was the " j^{th} " best performer in their respective groups.

3. Types of indicators which change.

Another frustration presented by time series is the fact that different types of indicators experience change differently. Some indicators are percentages, others are ratios, and others have no denominator. The last two are identical for our purposes in that they can theoretically experience unlimited growth. Percentage indicators can only grow to 100 percent, hence are a special problem.¹

There is no one best way to indicate changes in a percent series. The choice of the method must be decided afresh for each series. Usually, it is appropriate to give the size of the change, i.e., "x" changed "y" percentage points. Occasionally, the change as a percent of the starting percent is desired. At other times, the change as a percent of 100 percent less the starting percent is more meaningful. To illustrate these three methods let us suppose country "k" went from 40 percent to 60 percent literacy in fifty years. The first method says this is a change of 20 percentage points, the second says it was an increase of 50 percent, and the third says 33 1/3 percent of the illiterates became literate. Each method would give high scores to a different set of countries.

The basic problem is the fact that a change of "x" percentage points at one end of the scale is qualitatively different from the same change at the other end. For example, the change from 10 percent urbanization to

¹cf. Hovland, et. al., "A Baseline for Measurement of Percentage Change," in Lazarsfeld and Rosenberg, eds., The Language of Social Research, New York: The Free Press, 1955.

271

20 percent, although equivalent as a rate with the change from 90 percent urbanization to 100 percent, may be qualitatively different with respect to its social consequences. For most percent variables the last few units are the hardest. If it is true that the basic problem is the fact that changes of the same size in different parts of the scale are not equivalent, then the solution is to treat different parts of the scale separately and only compare the changes of countries with the same starting level. Thus both the problem and the solution are similar to those in the previous section.

Changes in ratios and in series without denominators seem to have similar problems even though there is no logical reason for this as there is with percents. Items per capita need not stop at any number, but they seem to reach saturation points. After a substantial base has been built up, ever increasing increments are necessary to maintain the growth rate. Eventually, a point is reached where the increments may keep growing, but not fast enough to keep the growth rate constant. For example, telephones and cars need not stop at one per family, but, on the other hand, it is unlikely that increases in wealth will forever be faithfully reflected in increasing numbers of cars and telephones (stations, not extensions). Railroads and roads per sq. km. can increase for centuries, but the rate of increase is bound to drop off after the basic transport infrastructure of a country has been laid down. Once again, there seems to be a qualitative difference between a 5 percent annual increase at an early stage of development and the same increase at a later stage.

In sum, the past two sections have shown that change scores are not comparable within the same series, different types of change indicators are not comparable, nor is it legitimate to use several methods of scoring change when changes are being compared. As a result, two growth series

272

cannot be correlated to prove a point, until the author has established their comparability. Usually, the series must be first made comparable by dividing the population into subsets of comparable countries.

4. The problem of different growth curves for different variables.

Even if one uses consistent methods and consistent types of indicators one will find that different variables have different growth curves. The fact that growth series have a curve pattern rather than a straight line pattern has already been discussed. It was noted that growth rates for one stage of the development curve are not comparable to growth rates at another stage. The fact that different variables have different growth curves means that similar stages are not comparable from variable to variable and thus care should be taken in interpreting correlations over time.

The concept of differential growth curves is related to the fact of successive leading industries. Some series, i.e., telephones, seem to show a fairly constant rate of increase throughout the series, but railroad travel and steel consumption per capita show a rapid rate of growth in the early stages of development and a leveling off at the upper stages. Airline travel per capita seems to start slowly and in the latter stages increase rapidly.

The above discussion of time series leads us to two conclusions. First, time series are very difficult to use. The data usually are not available, there is no completely satisfactory way to measure change series, different types of change series are not comparable, scorings within a series are not comparable, and different series have different growth patterns. It is extremely difficult, if not impossible, to determine to what extent variations should be attributed to the effect of the method of scoring, the type of series, or the growth patterns.

213

The second conclusion is the fact that a measure for overall development has not yet been developed. No single indicator is satisfactory since another indicator would give very different results. Eventually, perhaps, the study of development will become rich enough in data to circumvent this problem.

Nevertheless, in spite of the difficulties the possible insights which might be gained from inter-temporal studies are significant enough to warrant more exploration in this direction. One purpose of chapters 9 and 11 is to explore the possibility of using certain measures of educational output over time in "developing" as well as developed countries.

Empirical Models of Stages of Development

There is a current and useful tendency for writers on development and modernization to include in their analysis empirical models of different developmental stages. (Empirical models is a fancy title for computing means for each group on several variables. These means then become the statistically constructed "typical" country of stage "x".) Russett groups countries into five stages of modernization and compares the stages on several variables. Harbison and Myers' analysis and recommendations are based on empirical models of four stages of educational development. Deutsch constructs an empirical model for developing countries and predicts increasing political instability for these countries on the basis of the model. The Caplow study is moving in this direction. Useful though it is, eventually this approach will run its course and finally be eliminated by the availability of better time series.

274

Analysis by Sub- and Super-National Units

Considerable analytical power is developed when cross-national data can be supplemented by data for sub-national units. Sub-national data has three advantages. First, many variables are more or less controlled when districts are used instead of nations. It is common for all districts to have the same language, political system, educational system, religious composition, culture, and child-rearing practices. With these factors controlled, the variation in one variable can be attributed to the variation in another variable with more confidence. Second, new variables are generated. Each country can be scored for its amount of regional variation on various variables. Third, many more comparisons can be made. Districts "1" and "2" can be compared in country "A", districts "1" and "2" can be compared in country "B", district "1" in country "A" can be compared to district "1" in country "B" (district "2's", likewise), and district "1" in country "A" can be compared to district "2" in country "B" (and vice versa). The combination of these comparisons can go a long way toward ferreting out what influence belongs to which variables. Analysis by sub-national units is a valuable but under-used procedure.

Analysis by supra-national or regional units is another line of investigation that needs more experimentation. Two quite different analyses come under this topic. The first adds or averages national data and the second tries to break away from national data. The former is ably exemplified by Kuznetz.¹

To illustrate how a regional approach might alter correlations obtained between development variables (and therefore any subsequent interpretation)

¹Simon Kuznetz, "Regional Economic Trends and Levels of Living," in Philip Hauser, ed., Population and World Politics, New York: The Free Press, 1958.

275

four geo-cultural areas in the underdeveloped world may be isolated: Asia, Africa, Latin America and the Middle East. How well do certain of the general relationships noted when using world-wide data hold up in specific areas? Russett found a strong and significant (.001 level) relation between urbanization and primary-secondary enrollment ratios. Using his data, and considering the matter area by area, the following variations in the relation are found: Asia -- .48, sig. at the .05 level; Africa -- .41, sig. at the .01 level; Middle East -- .32, not sig.; Latin America -- .56, sig. at the .01 level. As further examples of this phenomenon, Ginsburg's data reveal that the relation between urbanization and literacy varies from .12 to .46 and between urbanization and GNP per capita from .02 to .58 when Africa, Asia and the Middle East are separately considered.

When considering the rankings of one country on several variables it is again apparent that comparison only to a geo-cultural area gives a different picture, as the following table indicates: (data from Russett)

<u>Variable</u>	<u>Argentina</u>		<u>Hong Kong</u>		<u>Egypt</u>	
	rank in world	rank in Latin Amer.	rank in world	rank in Asia	rank in world	rank in Middle East
Prim-sec. enrollment	39	6	57	8	79	8
Inhabitants per physician	5	1	46	5	42	4
Urbanization	14	2	1	1	41	4
GNP per capita	27	3	49	3	77	10
Radios	32	4	67	5	58	3
Industrial employment	28	2	3	1	54	5

Although differences are less dramatic (in Hong Kong, for instance, the range of rankings is reduced from 1-67 to 1-8) these differences allow a more valid comparison.

Review and Summary

To repeat the basic questions we are concerned with: 1) Do these cross-national studies offer new insights into the relationship between education and other variables in the development process? 2) Are they of value to the educational policy maker and the educational planner?

Because of the focus of this study, the first question is more important for our purposes, yet some attention will also be given to the relationship of the studies to the work of the planner. In considering the latter an initial distinction needs to be made between two aspects of the planning process: goal setting - where one wishes to go; and strategy formulation -- how one can get there. The first of these is not usually a task for the educational planner but rather for policy makers. The second is normally the task of the planner. It will be useful to keep this simple distinction in mind when considering the utility of cross-national statistical studies or any other analytic techniques.

The purposes of the cross-national studies, as stated by the authors whose studies have been discussed in this chapter, can be summarized as follows: 1) to allow clear and precise descriptions of societies, both by indicating level of performance on a number of variables and by giving some idea of the interrelationships among these variables; 2) to provide a means of control for the effects of differing variables, including error; 3) to provide data for concept and theory formulation; and 4) to provide data with which to validate concepts and theories derived in other ways.

To be more specific, some of the results of these studies will be examined in terms of the insights they offer, accepting for the moment that the data from which they are drawn are reliable, that appropriate statistical techniques have been applied, and so forth. For example, the problem of developing educational programs appropriate to rapid urbanization was considered by Russett who found a significant correlation between urbanization and primary-secondary and higher education enrollment ratios. This by itself, of course, does not indicate whether education as measured might be a necessary prerequisite of urbanization, or whether urbanization simply provides an economic and social climate conducive to schooling. This finding simply means that these variables tend to grow together; countries with a high proportion of people in cities generally have a high proportion of children in school. Better measures of both variables are needed to refine the association, and yet further analysis is needed to determine the time order of the association.

As another example, Russett found a significant negative correlation between birthrate and such educational measures as enrollment ratios and literacy. Countries ranking high on scales of educational enrollment or literacy rank low on a scale of live births per 1000 population. This is not surprising and tends to confirm the conclusions reached earlier in Chapter 4. The crucial information is not provided, however, as to whether schooling is a significant causal factor in lowering birthrates or whether both high amounts of education and low birthrates are the result of some other intervening variable. Further, if education tends to predispose its recipients to having smaller families, correlations such as these do not specify which level or type of education is most likely to promote this tendency. Of course our knowledge may be extended in a limited way by using

various educational measures -- for example low birth rates relate more strongly to primary-secondary enrollments than to higher education enrollment.

Findings such as these gain somewhat in significance when viewed in a larger context. Russett found that urbanization also related strongly to number of live births per 1000 population, availability of physicians and hospital beds, life expectancy, newspaper circulation, volume of foreign and domestic mail, numbers of radios and television sets, cinema attendance, gross national product per capita, employment in industry, and enrollment in higher education, among others. In short, a highly urbanized nation tends to be healthier, wealthier, better educated, more industrialized, and have more communication facilities than a highly rural nation. Moreover, this and several studies indicate that these variables are highly intercorrelated; that is, a high ranking on any one is likely to indicate a high ranking on the others.

This sort of information is valuable for if growth along one variable is being planned, one knows what other areas are either likely to or must (only careful internal analysis can tell which) expand, and can plan accordingly. This does not mean that all nations must or even ought to "look the same" at a particular stage of development or even develop along the same path; but knowing what the general pattern is at least permits one to know whether or not a deviation exists. (Since even high correlations are not perfect, rarely as high as .80, many substantial deviations included within the group of nations whose characteristics have been correlated may be assumed.)

Additional information can be gained by looking beyond the correlational pattern and examining the data upon which it is based. In Russett and Ginsburg these consist of rankings of all the countries for which data

77

were available on each variable. Argentina, for example, ranks as follows on the following series of intercorrelated variables: (data from Russett)

Primary-secondary enrollment ratio	39
Inhabitants per physician	5
Urbanization	14
GNP per capita	27
Radios per 1000 population	32
Percent of working age population in industry	28

Some authors of the cross-national studies use their data to demarcate different stages of development; that is, they subdivide the nations into groups having roughly similar levels of development. Such a procedure is designed not only to present a clearer picture of what the "most developed" groups look like but to allow a more realistic assessment of position and progress among the less developed groups.

There are two steps in isolating such subgroups. First a criterion for ranking is chosen. This can be a single measure, as in the Russett study where GNP per capita is used, or a combined index, as used by Harbison and Myers. In the latter work a composite index of human resource development was constructed by taking the arithmetic total of 1) secondary education enrollment ratio, and 2) higher education enrollment ratio multiplied by a factor of five. Once the nations of the world for which data are available have been rank-ordered, using the indicator or index chosen, the next step is to determine cutting points for groups or stages. This may be done simply by inspection, choosing distinct breaks in the rankings, if such can be found, as dividing lines. This is an arbitrary procedure, and choosing different cutting points can change substantially the characteristics of each group.

Harbison and Myers,¹ for example, included the following countries in their "Level III -- semi-advanced" stage:

<u>Country</u>	<u>Composite Index Score</u>
Mexico	33.0
Thailand	35.1
India	35.2
Cuba	35.5
Spain	39.6
South Africa	40.0
Egypt	40.1
Portugal	40.8
Costa Rica	47.3
Venezuela	47.7
Taiwan	48.4
Greece	48.5
Chile	51.2
Hungary	53.9
South Korea	55.0
Italy	56.8
Yugoslavia	60.3
Poland	66.5
Czechoslovakia	68.9
Uruguay	69.8
Norway	73.8

The composite index score of the highest ranking Level II country, Iraq, is 31.2; that of the lowest Level IV country, Denmark, is 77.1. Looking at the data, one could just as easily include Peru and Iraq, the two highest Level II countries, in the above group and exclude Poland, Czechoslovakia, Uruguay, and Norway.

The effect of this small change in cutting points upon the "typical" Level III country can be readily demonstrated. (The characteristics of the "typical" country represent the mean score for each Level on the variables selected.) In the table below are found the component or "model" variables used by Harbison and Myers, the mean score for Level III countries

¹Harbison and Myers, op. cit., p. 47.

- 281 -

on each variable as computed by them, the mean score for Level III countries on each variable if the boundaries of the group are changed, and the percentage change for each variable.

<u>Variable</u>	<u>Mean Score Level III</u>	<u>New Mean</u>	<u>% Change</u>
Composite index	50	44	.12
Per capita GNP (\$U.S.)	380	292	.23
First and second level teachers per 10,000 population	53	47	.11
Percent of active population in agriculture	52	56	.08
Scientists and engineers per 10,000 population	25	17	.32
Physicians and dentists per 10,000 population	7.7	6.0	.22
Primary enrollment ratio	62	56	.10
Primary-secondary enrollment ratio	66	61	.08
Secondary enrollment ratio	27	23	.15
Higher ed. enrollment ratio	4.6	4.0	.13
Percent of higher ed. students in scientific and technical faculties	26	24	.08
Percent of higher ed. students in humanities, fine arts, and law faculties	33	34	.03
Public expenditure on education as a percent of national income	3.1	2.8	.10
Percent of population aged 5-14	22	23	.05
Average change			.13

Although most of the changes are not great, it is significant that the three variables which do change dramatically in mean value for the level are those which most frequently enter discussions of economic growth and conventional manpower planning: per capita GNP and measures of high level scientific and medical manpower. Even small changes in the boundaries of a level or stage then may change substantially the model presented, and thus alter any goals and strategies prescribed on the basis of the model.

Since each of the three decisions involved in constructing such models, choice of ranking index, cutting points, and model variables, is arbitrary, it is clear that different researchers can produce distinctly

282'

different models, even when using the same data. It is instructive to note the differences between the models developed by Harbison and Myers and those by Russett. Their use of different ranking indices has already been noted. Harbison and Myers isolate four stages of human resource development; Russett isolates five stages. The model variables used by Harbison and Myers are listed above; Russett used the following: percent of population living in cities of more than 20,000; percent of adults literate; number of students in higher education per 100,000 population; number of inhabitants per physician, number of radios per 1,000 population; percent of the population voting; percent of adult population in the military; and expenditure of the central government as a percent of GNP. To illustrate the effect of these decisions an examination can be made of how one country, India, is treated in each of these works. India is listed in Level II by Russett and Level III by Harbison and Myers. Three of the model variables are roughly comparable. India is in a group which, according to Russett has a typical GNP per capita of \$87, 9.6 percent of its inhabitants urban, and approximately 2 physicians per 10,000 inhabitants. According to Harbison and Myers, India is in a group which has a typical GNP per capita of \$380, 52 percent of its population in agriculture, and 2 physicians per 10,000 inhabitants. The picture which a planner gets then, can depend rather heavily upon the model he decides to use.

Basically, empirical models attempt to substitute current cross-national data, of which an abundance is now available, for historical data, which is difficult to find. Current levels of development in different countries are treated as though they were stages of a time sequence in the development of one country. The "Stage III" model is taken to show what a "Stage II" country will look like at some time in the future. Such an

analogy is tenuous, as conditions and technology change over time. One cannot be sure that relevant variables (or relevant levels of them) today will be as relevant in the future. To take a simple example, thirty years ago a measure of relative number of radio receivers would not have been a discriminating variable, as even the most developed countries had very few; thirty years hence spreading technology may well make radios so universal as to make this measure again of no discriminatory value.

Even if the indicators used were appropriate and valid measures of significant variables, and the discussion in the first part of this chapter suggests that this is open to serious question, construction of empirical models of "stages" of development is a problematic device, in that it is based on 1) a series of arbitrary choices, and 2) a tenuous assumption of similarity between cross-national and time series data. Nevertheless, the student of development and the policy maker can gain insights from stage analysis which study of raw data and correlation matrices will not supply, providing that the weaknesses are kept always in mind.

Rather than building "models" of typical countries at different levels of development, another approach is to examine the association of variables for different levels of development. This is based on the notion that two variables might be highly correlated among less developed countries and poorly correlated among developed countries. For example, literacy might not be expected to be highly correlated with measures of development within a group of advanced countries because they all have nearly identical literacy rates, while there is a good deal of evidence that literacy is strongly associated with many measures of development among the less developed nations. To illustrate this approach, 66 countries having over 5 million population were ranked using the Caplow-Finsterbusch 1960

Development Ranking.¹ The distribution was broken first into three segments (terciles) and then into six segments (sextiles). Table 1 gives the tercile and sextile means, standard deviations, frequencies, and correlations with the Caplow-Finsterbusch index for five educational variables. The sextile frequencies are too small to make the correlations based on them significant, but the tercile correlations and the sextile means are the important parts of the table. There are several significant relationships which may be identified. Some series, like percent of females, first level graduates, and first level teachers seem to be approaching a limit or a point of very slow growth. Therefore, even if these factors contributed to development in the past, they may not contribute much to the further growth of developed countries. The two enrollment series, however, show different growth curves (to the extent that cross-sectional data can suggest growth patterns). For higher education especially, the peak in the growth curve comes late in the development process. The growth curve for sex composition of the second level might also be noted for its implications about changes in the culture of the middle and upper classes in underdeveloped countries.

¹The series used in constructing this index were: 1) Age, percent of population age 5-14; 2) Air travel, kilometers per capita; 3) Calories, daily consumption per capita; 4) Energy consumption, kilowatts per capita; 5) Fertilizer, kilograms per hectare; 6) Hospital beds per capita; 7) Motor vehicles per capita; 8) Movies, average annual attendance; 9) Newspaper circulation per capita; 10) Non-agricultural employment, percent of active population; 11) Physicians per capita; 12) Printing paper, kilograms per capita; 13) Processed materials as percent of exports; 14) Radios per capita; 15) Railroad network, meters per capita per population distance; 16) Road network, meters per capita per population distance; 17) Steel consumption, kilograms per capita; 18) Teachers per capita, primary and secondary; 19) Telephones per capita; 20) Urbanization, percent of population in cities over 100,000. (Theodore Caplow and Kurt Finsterbusch, Development Rank: A New Method of Rating National Development, New York: Columbia University, Bureau of Applied Social Research, 1966.) There appears to be little theoretical justification for choosing these twenty series; series were chosen which met a number of criteria, almost all of which were statistical in nature. This is not a serious problem in this context, however, as the index is being used simply to illustrate an analytic technique.

285

Table 1

STANDARD DEVIATIONS, FREQUENCIES, MEANS
AND PEARSON CORRELATIONS OF FIVE EDUCATIONAL SERIES
WITH THE CAPLOW - FINSTERBUSCH 1960 DEVELOPMENT RANKING
FOR THE 66 COUNTRIES HAVING OVER 5 MILLION POPULATION

	<u>TOTAL</u>	<u>Terciles</u>			<u>Sextiles</u>					
		<u>1</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
#1 Enrollment ratio of 1st & 2nd level to 5-19 age population, 1959										
Correlation	.93	.67	.66	.75	.31	.39	.21	-.07	.07	.62
Mean	.44	.67	.42	.22	.73	.61	.49	.33	.31	.13
Frequency	61	21	20	20	10	11	11	9	10	10
Standard Deviation	.22	.10	.11	.12	.07	.08	.07	.09	.08	.09
#4 Teachers in 1st & 2nd level per 1,000 population, 1960										
Correlation	.87	.38	.45	.73	.27	.55	-.25	.23	.18	.39
Mean	4.7	7.3	4.5	2.2	7.7	7.0	5.2	3.8	3.2	1.2
Frequency	66	22	22	22	11	11	11	11	11	11
Standard Deviation	2.5	1.6	1.4	1.3	1.6	1.4	.9	1.5	1.0	.8
#5 1st level graduates as percent of age 25 or over, 1960										
Correlation	.81	.29	.66	.42	.54	.25	.44	.46	.50	1.00
Mean	48	77	39	9	82	75	49	20	11	6
Frequency	34	13	15	6	4	9	10	5	4	2
Standard Deviation	33	22	25	10	20	22	23	16	11	3
#6 Ratio of females to total 2nd level students, 1960										
Correlation	.80	-.06	.81	.56	.18	.13	.41	.54	.22	.80
Mean	.36	.49	.37	.24	.48	.50	.44	.30	.28	.20
Frequency	54	18	16	20	10	8	8	8	10	10
Standard Deviation	.14	.08	.09	.11	.05	.10	.05	.07	.10	.10
#10 Students enrolled in Higher Education per 1,000 population, 1960										
Correlation	.62	.42	.38	.41	.46	.22	.30	.15	.42	.19
Mean	2.8	5.0	2.2	1.1	5.9	4.0	2.8	1.6	1.6	.30
Frequency	63	22	22	19	11	11	11	11	11	8
Standard Deviation	2.9	3.2	1.5	2.2	4.0	1.9	1.3	1.3	2.7	.5

Regardless of the way in which the data are manipulated, all cross-national statistical studies suffer from a number of weaknesses. First, the countries included in the studies are not random samples. They are selective samples of countries for which data are available and there is no reason for presuming that a basis exists from which to draw conclusions about them.

Secondly, cross-national studies seem to assume that development is a unidimensional concept for which better measures but not more precise definitions must continually be sought. Frequently lack of correlation, or deviation, appears to be thought of as showing that the indicators involved are poor measures of development. To the contrary, this deviation might be demonstrating that there are many aspects to development, sometimes correlated, but not identical. (This, of course, is the position taken throughout this work.) Moreover the complexity of this phenomenon of development further means that measures can only be made in terms of precise concepts they purport to measure, and the level of difference to be discerned among the units of analysis. The study of development suffers from the fact that to many scholars development involves sets of functioning social structures and their potentialities. These attributes are poorly reflected in qualitative terms.

In the area of cross-national studies perhaps too much exploratory research has been done, where a mass of indicators are correlated to see what results, with no previous hypothesis. This, as the reader may have gathered, is one of the key problems with the four studies examined here.

CHAPTER 8

MEASURING EDUCATIONAL OUTPUT - I

In the previous chapter some comment was made regarding the inadequacy of the educational indicators most commonly used in the study of development. The present chapter provides a continuation of this analysis and a description of two refined approaches to assessing educational output. In addition, consideration is given to the advantages of these approaches in the study of development and in educational planning, relative to each other and in comparison to other educational indicators.

The Need for Better Educational Indicators

It is generally agreed that education may be perceived as a process and that national development planning must be concerned with decisions about magnitudes of inputs and outputs from the educational processes operated by educational institutions in the country. The concepts of inputs and outputs currently used, however, are so gross and imprecise that one can have little confidence that actual human capabilities are being assessed. Social development is likely to demand increasingly specialized, differentiated and higher quality capabilities, requiring as inputs, therefore, more differentiated teaching, syllabi, and learning experiences.¹ Most presently used aggregated measures of educational output overlook this aspect of the problem.

The crudity of typical attempts at measuring the results of the educational process can be seen from the fact that the major output measure currently used in planning is graduates by academic level or, occasionally,

¹This is particularly true at the higher levels of education. This is not meant to ignore the likelihood that development will also demand role flexibility and skill substitutability, which may require fairly broad and unspecialized education at the lower levels.

by specialized course or division within levels. Usually this concept has been so aggregated that it loses homogeneity. To assume, for example, that all graduates at the university level are homogeneous in terms of their capabilities is erroneous, for there are obvious and important differences in kind of capability between an engineer and a lawyer. Also, graduates from secondary level trade and technical schools presumably have acquired different capabilities than graduates from academic secondary schools. When output is conceived in the usual way, then, it assumes that the educational inputs provided by different schools or curricula make no significant difference in the capabilities of graduates. This is patently untrue.

Furthermore, the graduates measure ignores school dropouts. Even though a pupil completes all the schooling required for a particular degree, if he fails to pass the leaving examination, he is not considered a product of the educational system. In fact, of course, if he has learned anything during his schooling, his capabilities have changed, and a large number of dropouts will render the output measures inaccurate.¹ Additionally, the use of the graduates concept as an indicator of educational output assumes the appropriateness of graduation criteria. If the concern is with education for development, and if examinations are based on bookish, memoriter criteria, as they often are, then passage of the examination reveals little about the graduate's capabilities, or how these are relevant to the skills required in the roles the graduate will play.

While graduates are the most common output measure, a variety of input measure such as enrollment, pupil-teacher ratios, expenditure per pupil,

¹An assessment of dropout and pass rates is also important because these have different meanings in different systems. In a highly selective system patronized by large numbers of students high dropout rates and low pass rates may indicate a high quality of education for both graduates and dropouts. In an unselective, under-patronized system low dropout rates and high pass rates may indicate a very poor quality of education.

etc., are frequently used. These, like the graduates measure are crude aggregates, and disguise as much as they reveal.

Thus concentration on the use of easily quantifiable educational measures has caused the important qualitative dimensions of the educational process to be ignored. Moreover, even the use of quantifiable factors does not eliminate the problem of achieving comparability of educational data over time and internationally. Since, for example, the length of primary or secondary schooling has varied over time in most countries, and since it also varies among countries at any point in time, even quantitative analyses of educational development are hazardous.

In summary, measures presently used are deficient because they do not designate the kind or level of capability attributed to the persons involved and, as a consequence, becloud the logic of the analysis of the role of education in development. They further confuse the establishment of output targets in educational planning by reliance on non-homogeneous categories and fail to permit the comparative evaluation of alternative strategies.

Output indicators in education should ideally meet several criteria. Among these are the following:

1. The indicator should be usable for all divisions of national educational systems. It should be appropriate to informal, non-school education, as well as to schooling.
2. The indicator should reflect what is learned by pupils. It should indicate not only what they have learned, but how well; that is, it should express the extent to which capabilities are achieved.
3. The indicator also should describe what is taught, or be capable of being linked with what is taught.

4. The indicator should be a homogeneous concept, one which does not aggregate in such a way as to conceal important differences in kind of output.
5. The indicator should be comparable, not only intra-nationally but also internationally, since in the present underdeveloped state of the art of educational analysis, hypotheses and generalizations about relationships frequently must be drawn from the experience of other countries and from other periods of history.

Ideally, of course, what is needed is some form of achievement testing which can be linked with quantitative expressions of the numbers of persons educated, when these are classified in narrow, homogeneous categories of kinds of capabilities. Further, this system of scoring should be capable of being linked with indicators of the levels of capability required in specific social roles (skills required by an electrician, by a father, etc.). In view of the efforts under way to create national and internationally comparable achievement testing devices, it may become possible ultimately to develop direct measures of this sort. The road to this goal, however will be long and hard.

More immediately, indicators must be sought which will satisfy the above criteria insofar as possible, and which will reflect capabilities acquired as accurately as possible but which are based on more readily available information.

Another, and perhaps the most immediately applicable, suggestion is to develop a set of indicators which may, together, reflect all of the important elements of the educational system, thus allowing the comparison of various "mixes" of elements, which is fundamental to marginal return analysis. Measures of the input elements, such as numbers of teachers,

number of students, and the time they spend in the educational system, are available. What are needed are good measures of the output elements. For example, achievement test scores or entrance examination scores for admission to higher schools may be useful for certain kinds of effectiveness analysis. This will require, however, careful study of the tests used and judgment about the relevance of the scores to development. Another output indicator which might be used for vocational education, both informal and formal, would be a measure of the numbers of graduates successfully employed. Other "success ratio" indicators of this sort might be used as rough indicators of the quality of the product of the individual educational divisions.

Recently two conceptually quite similar but operationally distinct measures of educational input and output have been devised. One may be identified as a "pupil-hours" measure¹ while the other may be designated as a "pass-years" measure,² each being specified for various curricular contents or content weightings. Although these measures are still in the process of being refined, they have been used operationally. In the following pages they will be examined and compared.

Pupil-Hour Measure

In establishing the rationale for the pupil-hour measure, education is defined as a "process which seeks the development of desired behavioral capabilities in human beings." The educational process is conceived as including two input elements and one output element. The input elements are (1) pupils and (2) the means for bringing about changes in their

¹Developed by Donald Sanders, Ohio State University.

²Developed by Kenneth L. Neff, Michigan State University.

- 292 -

behavioral capabilities.¹ The output element is the desired capabilities themselves.

With regard to the first input variable, pupils traditionally are selected from young people, in most societies between the ages of five and twenty-five. They are, or should be, those members of the society who lack and who do at present, or will in the future, require the behavioral capability which the process intends to develop. Presumably they also will be persons who will not acquire the behavior in other ways; otherwise, again presumably, the process would not be allocated the resources required for their education. Obviously, in practice this condition of rationality is not always met.

The appropriate universe from which pupils are selected may be defined in terms of age or sex, or on some criterion of "normality" in psychological and physical characteristics. Other frequently applied and often implicit criteria are place of residence (i.e. rural or urban), social class of parents, and ability to pay the required tuition.

The other input variable, the learning experiences which bring about the desired behavioral capability, is more difficult to analyze. Despite the fact that a great deal of educational research has been devoted to the analysis of various ingredients of learning experiences, it is not yet possible to describe adequately the necessary and sufficient elements of a generalized statement of the learning experience which would lead to a specified level of capability.

From a macro-analytical point of view, the learning experience variable is a complex set of individual learning experiences linked in content and

¹Some economists would consider (2) to be, not an input element, but a process element. They would suggest a three-stage model, including input (pupils), process (what pupils are taught), and output (behavioral capabilities achieved).

- 293

institutionally over time. It is in this variable that the so-called "qualitative"¹ aspects of education appear. These are the inputs which cause learning to occur. There is no conventional way to describe them, much less to measure them. But they are vital to understanding the phenomenon of educational development. They are the factors which control and condition the capabilities which may be achieved by pupils. In the next section a method for the measurement of some dimensions of learning experiences will be proposed.

The output variable also causes difficulty. No satisfactory way of identifying and measuring the behavioral outputs of education has yet been developed. However at the present time it may be possible to develop means for estimating such output.

Measurement of variables. Each of the variables involved incorporates both a qualitative and a quantitative dimension. These may be expressed in three questions:

1. How many pupils of what types were selected for education?
2. What learning experiences of what types were provided and how many?
3. What behavioral capabilities were achieved, to what degree, by how many?

Each of these is considered in turn.

1. Pupils.

Pupil inputs may be measured more directly, and probably more accurately, than the other variables. From the fairly adequate enrollment statistics

¹This use of "qualitative" -- in contradistinction to quantitative -- implies nothing about the quality of instruction.

which exist, it is possible to trace patterns of change in the magnitude of several important characteristics of the pupil factor. These are:

- (1) Total pupils enrolled in all schools;
- (2) Total pupils enrolled by level or by grade;
- (3) Pupils enrolled in schools by sex;
- (4) Pupils as a proportion of the school age group;
- (5) Pupils by age cohort as a proportion of the school age group.

These quantitative variables have been studied frequently. However, deficiencies of definition and data collection have restricted the usefulness of much of this work.

2. Learning experience.

It is possible to identify and to measure some apparently significant characteristics of the learning experiences to which pupils are exposed during the period of development. It was mentioned above that there is no present knowledge about the learning experience inputs necessary and sufficient to achieve any specified behavioral capability. There is not even an established way to describe or to measure them. Since this variable is so significant and educational theory does not provide a means for this measurement, one must be developed.

The subject matter (content) of learning experiences to which pupils are exposed may be inferred from the standard subjects of the regular school curriculum. This is an indirect and probably inexact means through which the concepts, statements, and generalizations which students are expected to learn may be identified. It is not possible to know what the "messages" expressed by teachers actually were, nor how effectively these were learned by students, but it is possible to estimate what general classes of content have been thought important by the curriculum builders of particular countries at specified times.

295

The suggested way of measuring patterns of change in learning experiences is to identify the proportion of school time devoted to a particular subject. If the amount of time, or proportion of time, devoted to a particular subject increases, it may be inferred that the increase is needed to develop the desired competency of pupils in that particular subject matter area. A decrease would imply the converse. Before such a method of measurement can have much meaning in terms of educational development, however, it is necessary to find a way to compare the subject matter of the schools in various countries. For this purpose, a classification system must be constructed which will be applicable to the curricula of various countries. The proposed classification of school course content is outlined below.

The basis on which the classification is made is the presumed purpose or objective sought by the school authorities in establishing a course as it appears from the course title. In this system, seven major categories of human development are identified, in terms of the kinds of problems which learning this subject would enable the pupil better to solve. In the use of the system a course title is tried against each category in turn, with the last category serving as a collector of residual courses not fitting other categories. The seven categories are as follows:

1. Communication: Includes all courses intended to develop the students' capacity to communicate. Includes reading, writing, grammar, speech, rhetoric, etc. in students' native language.
 - 1.1 Native language instruction.
 - 1.2 Foreign language instruction.
 - 1.3 Ancient language instruction.

-296-

2. **Social Subjects:** Includes all courses intended to provide the student with concepts, statements and generalizations used in his culture to understand and to deal with the social environment. Includes courses in religion, morals, philosophy, history, geography, social sciences, art and music appreciation, etc.
3. **Mathematics:** Includes all courses intended to develop the students' ability to use the tools of mathematics. Includes all courses in arithmetic, algebra, geometry, calculus, etc.
4. **Science Subjects:** Includes all courses intended to develop the students' capacity to understand and to deal with his physical environment. Includes biology, chemistry, physics, general science, natural science, astronomy, etc.
5. **Personal Development:** All courses intended to develop the students' abilities as an individual or as a member of the social group. Includes physical education, sports, military drill, art, drawing, singing, shop work and handicrafts, etc., when the apparent purpose is to develop the student's own ability to perform these activities.
6. **Specialized Education:** All courses intended to develop the students' capacity to be economically productive in an occupation. Includes all vocational, occupational, trade and professional education.
7. **Others:** All courses not otherwise classifiable. Includes study periods in school and elective courses selected at the choice of the student, which cannot be allocated to individual categories above.

This measurement of learning experiences in terms of seven categories of content, measured by time, provides an accurate, comparable, and feasible measure of the kind and amount of education provided. It measures the amount of time thought necessary or appropriate to provide learning experiences

297

according to the syllabus and teaching technology in force in a particular country at a specific point of time. It does not describe exactly what was included in those learning experiences, but it does indicate the amount and type of specialized teaching resources thought to be necessary for bringing pupils to an acceptable level of competency, on average.

Category 6, specialized education, calls for more detailed comment. In this category, all courses which are not general education are aggregated. However, the range of possible specializations is very wide, virtually as wide as the range of skilled occupations in the whole society. It may be appropriate to aggregate in this way for certain macro-analytical purposes. However, it would be useful, particularly for educational planners using manpower criteria, to have information on the kinds of occupational preparation provided in formal schooling. Therefore, it is proposed that identification of the specific occupation or occupational family for which education is provided, be provided for in data collection; in other words, that category 6 be subdivided according to professions for which persons are prepared.

At the third level of education, it is particularly important to identify the major families of occupations for which preparation is provided and to assess the magnitude of this provision. This is important for three reasons:

- (1) because professional skills are not readily interchangeable;
- (2) because the preparation of a cadre of highly skilled persons is thought to be essential for national development; and
- (3) because at present information is lacking about the magnitude of such preparation which has accompanied successful development.

298

Therefore, it is proposed that curriculum-hours and pupil-hours data be accumulated for third-level education according to the following classification system. It is based upon the basic system and may be integrated with it:

1. Communication
 - 1.1 Native language and literature
 - 1.2 Foreign language and literature
 - 1.3 Ancient language and literature
2. Social Science and Humanities not elsewhere classified
3. Mathematics
4. Science and Technology
 - 4.1 Pure science
 - 4.2 Engineering
 - 4.3 Architecture
 - 4.4 Technologies not elsewhere classified
5. Personal and Social Development
 - 5.1 Physical education, gymnastics
 - 5.2 Art, Music and Dance
6. Professional Education
 - 6.1 Agricultural professions
 - 6.1.1 Agriculture
 - 6.1.2 Home economics
 - 6.1.3 Fisheries
 - 6.1.4 Forestry
 - 6.1.5 Veterinary medicine
 - 6.2 Business commerce
 - 6.3 Education

6.4 Health services

6.4.1 Medicine

6.4.2 Dentistry

6.4.3 Pharmacy

6.4.4 Nursing

6.4.5 Health services not elsewhere classified

6.5 Law

6.6 Theology

6.7 Military

In order to measure the learning experience variable in terms of time, school programs indicating the required courses or subjects which must be taken by students are needed. Normally, these programs exist in forms which specify the number of class periods per week which all students will attend in each grade of the school. These periods can be converted to internationally comparable form by adjusting them to reflect the actual number of hours (60 minutes) provided in the whole school year. This conversion requires two additional bits of data: the number of minutes in a class period and the number of weeks per school year. Then,

$$\begin{array}{lcl} \text{actual hours} & & \text{number of minutes} \quad \text{number of weeks} \quad \text{number of periods} \\ \text{per year} & = & \frac{\text{per period} \quad \times \quad \text{in school year} \quad \times \quad \text{per week}}{60} \end{array}$$

3. Behavioral capabilities.

As discussed above, the output of education, conceived as behavioral capabilities of those educated, cannot be measured directly in a study of this sort. Input measures already described are used to estimate output, accepting an admittedly untested assumption.

300

This assumption is that learning actually achieved (the behavioral capabilities acquired) increases generally as the time spent in school increases. Obviously, the relationship is neither precise nor direct. Of course, other qualitative factors also influence output and may be more important than the amount of time spent teaching a subject. However, in a general way, considering aggregations of both subject matter and numbers of pupils, it is thought likely that the assumption would hold; that pupils with no education in a subject would score near zero, and that average scores would rise with more hours of education up to some point of diminishing returns. Thus, in effect, for the sake of measurement "capabilities sought" are equated with "capabilities achieved."

These measures, number of pupils and curriculum hours, are not only important in terms of their assumed relationship to behavioral capabilities. Using the data acquired for these two variables it is possible to construct a number of indices which may give insight into important features of educational development. The multiplication of the pupil measure by the learning experience measure (number enrolled times annual curriculum hours) gives a product "pupil hours of education."¹ This statistic represents an estimate of the magnitude of learning (capabilities achieved) in the whole system of education if the assumption is valid. It represents the magnitude of teaching (capabilities sought) in any case.

This measure may be aggregated in a variety of ways to determine how many were educated in what. For example, it is possible through this combined measure to determine how many pupil hours of mathematics were

¹This measure clearly does not take account of the amount of time spent on homework. The relative amount of time spent in and out of school on school assignments varies considerably from country to country, but there are little data available on homework hours.

251

provided in the national school system. It is also possible to estimate the number of pupil hours of education provided the children age 5-14 and to use this data with population statistics to determine the amount of educational effort provided at particular points in time in a form which may be compared with similar data for other countries. A large number of individual applications of this statistic is possible. Each of them would permit analysis through one set of data of the number of pupils educated and the amount of schooling provided to a particular part of the school population.

In summary the proposed indicators for the input and output variables are as follows:

Pupil Variable

1. Total pupils enrolled in all schools.
2. Pupils enrolled by level of schooling.
3. Pupils enrolled by level of schooling by sex.
4. Pupils as a proportion of population ages 5-24.
5. Pupils by age cohort as a proportion of the population ages 5-9, 10-14, 15-19, 20-24.

Learning Experience Variable

1. Total curriculum-hours by level of schooling.
2. Total curriculum-hours by nominative age cohort 5-9, 10-14, 15-19, 20-24.
3. Curriculum-hours by category of content by nominative age cohort for selected tracks of education (classical-literary, mathematics-science, practical-vocational).
4. Curriculum-hours by category of content for period of compulsory schooling.

302

Pupil-Hours Variable

1. Total pupil-hours in schooling.
2. Total pupil-hours by level of education.
3. Total pupil-hours in specialized education (category 6).
4. d.o. by primary and secondary levels -- pupil-hours by sub-category of specialized education at higher education level.
5. Total pupil-hours in general education (categories 1-5).
6. d.o. by level of education.
7. Total pupil-hours in general education by category (1-5).
8. d.o. by level of education.
9. All indices above by appropriate age groupings which are uniform internationally (probably age groups 5-9, 10-14, 15-19, 20-24).
10. Total pupil-hours as proportion of available hours in the population 5-24 (the index of educational effort).
11. Index of educational effort by age groups (5-9, 10-14, 15-19, 20-24) for
 - total pupil-hours in specialized education,
 - total pupil-hours in general education.
12. Index of educational effort by levels of schooling same as 11.
13. All of the above by sex of pupil.

Illustration of the Pupil-Hour Method

In various experimental versions the pupil-hour measure has been applied to some school types in twelve different countries. Although the complete range of suggested data was collected in no case, it appears that the requisite information can be found, given enough time and money. A small

232

sample of the results of this work will be presented here, as well as a discussion of the problems encountered in each case.

Table 1 shows an overall estimate of elementary and secondary output in Japan for the period 1870 to 1962. Table 2 indicates an analogous estimate for Sweden from 1880 to 1962.

Both of these tables show pupil hour output from formal schooling by subject matter classification. Japan shows a regular steady growth from 1870 to 1940. The 1950 total, however, marks a dramatic increase over 1940. This reflects changes in the Japanese system. The length of compulsory education was raised from 6 to 9 years in 1947. This change made lower secondary education compulsory for the first time and added a year (year 9) to the length of time most students spent in the schools (immediately prior to 1940 most students were completing grade 8). After the Second World War there was also a substantial increase in the number of students proceeding on to higher secondary schools. These changes produced a more than seven-fold increase in pupil hours at the secondary level during this decade. In Sweden there has been a fairly regular growth at the elementary level since 1880. There are two quite marked jumps in secondary pupil hours, between 1910 and 1920, and between 1940 and 1950.

204

TABLE 1

JAPAN

TOTAL OUTPUT FROM ELEMENTARY AND SECONDARY EDUCATION 1870-1962
(Millions of Pupil Hours)

		<u>Communi-</u> <u>cation</u>	<u>Social</u> <u>Subjects</u>	<u>Mathematics</u>	<u>Science</u>	<u>Personal</u> <u>and Social</u> <u>Development</u>	<u>Vocational</u>	<u>Other</u>	<u>Total</u>
1870	elem.	452	70	200	-	139	-		861
	sec.	1.3	.6	.5	.6	1.6	2.2		6.8
	total	453.3	70.6	200.5	.6	140.6	2.2		867.8
1880	elem.	801	123	354	-	247	-		1525
	sec.	4.8	1.7	1.7	1.4	3.8	2.3		15.7
	total	805.8	124.7	355.7	1.4	250.8	2.3		1540.7
1890	elem.	1038	180	456	12	344	-		2030
	sec.	7.1	2.9	2.2	2.2	5.2	2.4		22.2
	total	1045.1	182.9	458.2	14.2	349.2	2.4		2052.0
1900	elem.	1529	315	666	46	561	-		3117
	sec.	32.7	12	10.7	8.6	23.9	7.2		95.1
	total	1561.7	327	676.7	54.6	584.9	7.2		3212.1
1910	elem.	2050	568	914	139	984	28		4683
	sec.	67.2	27.8	20.1	17.2	40	7.4		179.7
	total	2117.2	595.8	934.1	156.2	1024	35.4		4862.7
1920	elem.	2556	728	1142	183	1248	48		5905
	sec.	110.7	47.7	32.5	28.5	71.3	16.8		307.5
	total	2666.7	775.7	1174.5	211.5	1319.3	64.8		6212.5

TABLE 1 (Continued)

		<u>Communi ication</u>	<u>Social Subjects</u>	<u>Mathematics</u>	<u>Science</u>	<u>Personal and Social Development</u>	<u>Vocational</u>	<u>Other</u>	<u>Total</u>
1930	elem.	2668	977	1292	300	1404	209		6850
	sec.	210.1	106.4	61.7	70.9	136.4	95		680.5
	total	2878.1	1083.4	1353.7	370.9	1540.4	304		7530.5
1940	elem.	2886	1119	1416	346	1628	677		8072
	sec.	261.6	142.3	95.3	93.5	170.4	117.1		880.2
	total	3147.6	1261.3	1511.3	439.5	1798.4	794.1		8952.2
1950	elem.	4665	2532	*	#	3592	-	**10789	
	sec.	930.6	743.5	654.5	706.4	1916.1	603.4	1038.4	6592.9
	total	5595.6	3275.5	654.5	706.4	5508.1	603.4	1038.4	17381.9
1955	elem.	5103	2776	*	#	3938	-	**11817	
	sec.	1072.9	834.4	753.3	810.4	2159.6	696.3	1390.9	7717.8
	total	6175.9	3610.4	753.3	810.4	6097.6	696.3	1390.9	19534.8
1962	elem.	2215.5	1205.2	1447	867.9	2309.5	-	-	
	sec.	1363.5	1517.8	984.8	1104.2	2238.5	448.4	1466.4	
	total	3579.0	2723.0	2431.8	1972.1	4548.0	448.4	1466.4	17168.8

* Mathematics combined with Communication in the curriculum.

Science combined with Social Subjects in the curriculum.

** Electives.

TABLE 2

SWEDEN

TOTAL OUTPUT FROM ELEMENTARY AND SECONDARY EDUCATION 1880-1962
(Millions of Pupil Hours)

		<u>Commun- ication</u>	<u>Social Subjects</u>	<u>Mathematics</u>	<u>Science</u>	<u>Personal and Social Development</u>	<u>Vocational</u>	<u>Other</u>	<u>Total</u>
1880	elem.	180	103	74	23	100	46		526
	sec.	4.7	4	2.6	1.6	.9	-		13.8
	total	184.7	107	76.6	24.6	100.9	46		539.8
1890	elem.	194	111	80	25	108	49		567
	sec.	4.6	4.2	2.6	1.6	.9	-		13.9
	total	198.6	115.2	82.6	26.6	108.9	49		580.9
1900	elem.	209	119	86	26	116	53		609
	sec.	5.6	4	2.4	1.8	1.2			15
	total	214.6	123	88.4	27.8	117.2	53		624
1910	elem.	212.2	121.2	87.1	27	118.1	54		619.6
	sec.	7.4	5.1	3.2	2.4	1.6			19.7
	total	219.6	126.3	90.3	29.4	119.7	54		639.3
1920	elem.	202	116	84	26	112	51		591
	sec.	21.5	14.6	8.7	6.4	10.2			61.4
	total	223.5	130.6	92.7	32.4	122.2	51		652.4
1930	elem.	191	110	79	25	107	49		561
	sec.	24	16.5	9.5	7.1	11.3			68.4
	total	215	126.5	88.5	32.1	118.3	49		629.4

TABLE 2 (Continued)

		<u>Commun- ication</u>	<u>Social Subjects</u>	<u>Mathematics</u>	<u>Science</u>	<u>Personal and Social Development</u>	<u>Vocational</u>	<u>Other</u>	<u>Total</u>
1940	elem.	165	95	69	21	92	42		484
	sec.	23.7	16.8	9.5	11.1	11.1			68.5
	total	188.7	111.8	78.5	103.1	103.1	42		552.5
1950	elem.	160	92	66	20	89	41		468
	sec.	46.9	29.3	15.7	16.5	28.2	5		141.6
	total	206.9	121.3	81.7	36.5	117.2	46		609.6
1955	elem.	205	117	84	26	114	52		598
	sec.	55.9	35.1	18.8	21	32.2	6.4		169.4
	total	260.9	152.1	102.8	47	146.2	58.4		767.4
1962	elem.	228	126.5	91.9	32.4	163.2	6.7	4.5	653.2
	sec.	58.1	33.9	19.7	21.2	37.7	6.2	.2	177
	total	286.1	160.4	111.6	53.6	200.9	12.9	4.7	830.2

Table 3 presents data for the Spokane school district, an urban public school district in a Western United States community, with a present population of around 190,000 persons. The district was founded in 1889, although the first school was established in 1875. This district was chosen to illustrate the method because easy access to data was possible and because there is little reason to believe it is not fairly representative of the more than 30,000 public school districts in the United States. It would be most interesting to determine what historical events and trends in Spokane produced the rapid increase in output between 1911 and 1921, and the slow decline in output after 1931.

Another institution has been studied to illustrate the application of the method at the higher educational level. Table 4 presents data describing the development of the Ohio State University, a large land grant university. Rapid growth between 1873 and 1910 is apparent. The slight decrease in 1920 may reflect the impact of the First World War on the college age manpower pool. The striking increase in 1950 over 1940 likely is the result of enrollment increases produced by the free education provided for returning veterans of World War Two.

TABLE 3

SPOKANE SCHOOL DISTRICT #81TOTAL OUTPUT 1890-91 - 1960-61
(Thousands of Pupil Hours)

		<u>Commun-</u> <u>ication</u>	<u>Social</u> <u>Subjects</u>	<u>Mathematics</u>	<u>Science</u>	<u>Personal</u> <u>and Social</u> <u>Development</u>	<u>Vocational</u>	<u>Other</u>	<u>Total</u>
1890-91	elem. & sec.	1519	275	359	95	1256	4	-	3508
1900	elem.	Not available							5245
	sec.	146.3	58.5	79.4	29.7	-	7.5	-	321.4
									5566.4
1910-11	elem.	4256.3	707.9	991.2	646.6	2239.5	-	-	8841.5
	sec.	511.7	107.9	191.3	98.8	110.3	41.8	-	1061.8
	total	4768.0	815.8	1182.5	745.4	2349.8	41.8		9903.3
1920-1	elem.	7086.9	1676.6	1426	177.5	4640.4	-	638.0	15645.4
	sec.	1285.8	369.9	503.3	290.6	846.2	261.1	708.7	4265.6
	total	8372.7	2046.5	1929.3	468.1	5486.6	261.1	1346.7	19911.0
1930-1	elem.	6267	1688.7	1415.5	196.5	4294.3	-	654.4	14516.4
	sec.	1746.5	361.0	691.0	549.7	1174.6	392.6	1079.0	6494.4
	total	8013.5	2549.7	2106.5	746.2	5468.9	392.6	1733.4	21010.8
1940-1	elem.	4722.8	1317.7	1104.0	160.8	3280.1	-	515.7	11101.1
	sec.	1738.0	821.4	317.9	657.6	1271.8	564.8	1169.9	7041.4
	total	6460.8	2139.1	1921.9	818.4	4551.9	564.8	1685.6	18142.5
1950-1	elem.	6607.6	1592.4	1401.4	177.4	4343.2	-	612.0	14734.0
	sec.	1168.5	727.8	461.1	404.2	1129.4	446.3	864.3	5201.6
	total	7776.1	2320.2	1862.5	581.6	5472.6	446.3	1476.3	19935.6
1960-1	elem.	5404.2	1751.1	1926.2	246.1	3451.3	-	149.7	12928.6
	sec.	1106.8	583.6	426.9	419.7	746.7	309.8	716.0	4309.5
	total	6511.0	2334.7	2353.1	665.8	4198.0	309.8	865.7	17238.1

OUTPUT OF HIGHER EDUCATION
PATTERNS OF DEVELOPMENT OF THE OHIO STATE UNIVERSITY 1873 - 1965
(Annual Pupil Hours)

	1873/1874	1879/1880	1889/1890
1. COMMUNICATION	5 417	31 512	81 593
1.1.-Native Lang. & Lit.	5 417	8 271	23 561
1.2.-Foreign Lang. & Lit.	-	7 054	37 801
1.3.-Ancient Lang. & Lit.	-	16 187	20 231
2. SOCIAL SCIENCES & HUMANITIES	2 917	8 750	21 180
2.1.-Social Sciences n.e.c.	2 917	8 071	17 120
2.2.-Humanities n.e.c.	-	679	4 060
3. MATHEMATICS	7 708	23 522	34 280
4. SCIENCE & TECHNOLOGY	4 792	53 142	84 448
4.1.-Science	4 792	39 229	65 306
4.2.-Engineering	-	6 667	13 475
4.3.-Architecture	-	-	-
4.4.-Technologies n.e.c.	-	7 246	4 667
5. PERSONAL & SOCIAL DEVELOPMENT		6 846	6 328
5.1.- Physical Education-Gymnastics	-	-	-
5.2.- Art - Music - Dance	-	6 846	6 328
6. PROFESSIONAL EDUCATION	2 083	14 841	57 333
6.1.-Rural Professions (SUB-TOTAL)	2 083	1 521	16 585
6.11.-Agriculture	(2 083	(1 521	(8 933
6.12.-Home Economics	(-	(-	(-
6.13.-Fisheries	(-	(-	(-
6.14.-Horticulture & Forestry	(-	(-	(2 221
6.15.-Veterinary Medicine	(-	(-	(5 431
6.2.-Business Commerce	-	-	-
6.3.-Education	-	-	-
6.4.-Health Services (SUB-TOTAL)	-	-	3 392
6.41.-Medicine	-	-	-
6.42.-Dentistry	-	-	-
6.43.-Pharmacy	-	-	3 392
6.44.-Nursing	-	-	-
6.45.-Health Services n.e.c.	-	-	-
6.5.-Law	-	-	614
6.6.-Theology	-	-	-
6.7.-Military	-	13 320	36 742
7. OTHER	-	-	-
TOTAL	22 917	138 613	284 162

(1) These data are exclusive of summer term graduate and continuing education programs; as a consequence they should be considered preliminary and subject to revision.

(2) Completed from credit hours data; see text.

(3) Spring and Fall Terms, 1964 and Winter Term, 1965.

TABLE 4 (cont.)

24 a

1899/1900	1909/1910	1919/20 ⁽²⁾	1929/30 ⁽²⁾	1939/40 ⁽²⁾	1949/50	Credit	Contact
						Hrs. basis 1964/65 ⁽³⁾	Hrs. basis 1964/65 ⁽³⁾
780 615	1 097 668	845 346	753 673	618 853	822 992	1 916 214	2 309 240
422 459	638 762	409 921	512 795	420 505	590 578	1 280 265	1 545 430
233 398	440 802	380 692	226 541	189 771	217 124	518 229	622 540
124 767	18 104	14 733	14 337	8 577	15 290	117 720	141 270
81 600	198 026	251 335	829 895	993 697	1 751 987	3 003 063	3 679 950
65 950	194 209	196 853	794 466	971 467	1 690 332	2 577 172	3 168 860
15 650	3 817	54 512	35 429	22 230	61 655	425 891	511 090
169 103	797 837	235 247	193 425	253 330	325 596	1 019 876	1 230 100
716 783	1 811 851	1 099 887	1 102 946	1 371 986	2 724 485	1 570 632	3 311 620
494 607	707 402	743 264	682 549	941 250	1 536 624	1 064 766	2 407 960
209 099	845 224	266 337	362 565	370 444	920 279	495 038	879 140
-	30 514	25 811	29 333	21 572	166 943	N.A.	N.A.
13 077	228 711	64 475	28 499	38 420	100 639	10 558	24 520
63 640	191 502	256 055	270 260	435 790	1 337 662	949 346	1 947 410
59 100	123 767	238 475	137 335	181 746	738 562	417 442	956 400
4 540	67 735	17 580	132 925	254 044	598 100	531 904	991 010
199 876	543 169	706 841	1 072 885	1 599 804	3 345 899	2 556 148	3 430 170
82 094	315 193	427 315	227 613	551 189	985 253	479 747	927 700
(49 188	(89 979	(247 137	(146 485	(222 552	(527 717	(186 776	(430 930
(13 032	(34 185	(46 796	(13 988	(181 072	(159 228	(114 637	(155 720
(-	(-	(-	(-	(-	(-	(-	(-
(4 945	(20 987	(39 309	(19 039	(55 889	(81 791	(36 965	(47 150
(14 929	(170 042	(94 073	(48 101	(91 676	(216 517	(141 369	(293 900
-	-	-	239 562	337 447	713 559	403 967	490 300
5 967	6 912	45 796	191 352	258 080	532 417	623 225	619 370
9 644	68 072	97 896	205 257	367 094	592 823	623 326	837 570
-	-	14 392	68 236	218 252	180 922	162 652	307 240
-	39 998	41 417	81 783	58 973	182 408	249 082	355 970
9 644	28 074	38 670	36 263	42 637	110 935	73 689	106 700
-	-	-	1 687	33 102	41 707	115 712	42 140
-	-	3 417	17 288	14 130	76 851	22 191	25 520
67 796	92 100	62 357	103 602	85 994	182 764	146 436	145 530
-	-	-	-	-	-	-	-
34 375	60 892	73 477	105 499	N.A.	339 083	279 447	409 740
-	-	-	-	-	116 699	-	-
2 011 617	4 640 053	3 394 711	4 223 084	5 273 460	10 425 320	11 015 279	15 908 490

312

Pass Year Measure

In another attempt to obtain a measure relating schooling to the capability of the citizenry, educational output is expressed as annual net additions to the educational value of a society's human capital stock. This is essentially a man-hour or man-year approach in which input is the total of teacher and student man-years spent in class and output is the total of successful "pass years" each year that are the result of such input.

For determining gross output, enrollment figures are first converted to "pass years."¹ Pass years are computed in the following manner.² A table of grade-by-grade enrollment, adjusted by the percentage of repeating students in each grade, is constructed for a number of consecutive years. Pass years in grade I in year t are represented by grade II enrollment in year $t+1$, less the number of repeaters in grade II in year $t+1$ (e.g., if grade II enrollment in 1964 is 62,500, and 3500 of these are repeating grade II, then 59,000 students completed grade I in 1963). This adjusted enrollment, 59,000, is further adjusted by average absence rates. In order to account for those who complete the last year of secondary schooling and those who graduate from the primary or intermediate levels and do not go on to the next level, secondary graduates in year t and school-leaving graduates (those who graduate from primary or intermediate school and do not go on) in year t are added to the basic pass year measure. Thus pass years

¹The pass year measure is only used for primary and secondary education; for higher education a slight modification, using "degree years" is used.

²In this discussion t represents a base year, $t+1$ the following year, E enrollment, and Roman numerals the grade level.

for year t consist of: $(\text{adjusted E II to XII})_{t+1} + \text{school-leaving graduates}_t + \text{higher secondary graduates}_t$.¹

In order to determine gross output, pass years are weighted by curriculum content and life expectancy of behavioral capabilities acquired. The following procedure is used. For each grade it is necessary to know the hours per year devoted to each subject matter area. Each subject matter area is classified into one or more of the following four development categories.

1. Educational enculturation: those courses which provide behavioral capabilities essential to continued role playing in the educational systems.
2. National acculturation: those courses which help provide behavioral capabilities intended to promote increased, effective participation in national, as contrasted to local or other sub-national, subcultures or behavior systems.
3. Technical acculturation: those courses that impart knowledge that is not specifically related to any occupational behavioral system.
4. Occupational enculturation: those courses that specifically relate knowledge to the role requirements of an occupational subculture or behavior system.

These four categories are based in part upon work done by Steward² who interpreted national culture as including both horizontal and vertical subcultures. Categories 1 and 2 are vertical subcultures, the educational

¹This is actually, in economic terms, an inventory flow model, consisting of flows from E_i to E_{i+1} (i = grade level) between year t and year $t+1$, plus pupils leaving levels of the system in year t .

²Julian H. Steward, Theory of Culture Change, Urbana, Illinois: University of Illinois Press, 1963.

214

(institutional) subculture being one national (institutional) subculture. Vertical subcultures may be thought of as "power systems" which create a mode of behavior overlapping and including, but distinct from that found in any of their component horizontal subcultures. Categories 3 and 4 are horizontal subcultures. Horizontal subcultures are present in virtually all communities, although there will be a variety of occupations and technical specializations.¹

Thus, plumbers or physicians belong to horizontal subcultures with prescribed modes of behavior but when plumbers or physicians become administrators, bureaucrats or politicians they "act differently." Indeed in their vertical subculture role similarities in their mode of behavior may be seen. This is not, of course, to say that differences in power do not exist between plumbers and physicians. One (or more) horizontal subculture may dominate the vertical (and hierarchical) structure.

Most subject areas fall in at least two of the above categories and some fall in all four. A subject area falling in two of the categories would be weighted twice; a subject area falling in three categories, three times, etc. Curriculum is thus weighted in relation to the type of behavioral capability sought and type of role which such capability permits the student to more effectively perform. An example of the classification of some subject matter areas is shown below.

¹Many other schemas could be used, of course, to assist in differentiating among the various schools' curriculum offerings. As one example, Talcott Parsons in his social systems analysis argued that all viable social systems have achieved some specialization in four functions: adaptive, goal-attainment, pattern-maintenance and integrative. School curricular and extra curricular experiences might be related to one or more of these functions. Similarly further developments in the concept of social role might allow for a more precise categorization of formal learning experiences.

215

TABLE 5
SUBJECTS AND THEIR DEVELOPMENT CATEGORIES

	<u>1</u>	<u>Categories</u>		<u>4</u>
		<u>2</u>	<u>3</u>	
1. National Language	X	X	X	X
2. Non-national vernacular language. .	X			X
3. Foreign Language	X		X	X
4. Mathematics	X		X	X
5. General Science	X		X	
6. Biology	X		X	
7. Chemistry	X		X	
8. Physics	X		X	
9. Mechanics	X		X	
10. General Social Science.	X	X	X	
11. Economics	X	X	X	
12. Civics and Ethics	X	X	X	
13. Geography	X	X	X	
14. History	X	X	X	
15. Vocational Skills			X	X
16. Physical Education.		X		
17. Hygiene and Health.		X	X	
18. Writing	X	X	X	X
19. Elective subjects	X		X	
20. Open (self-expression)	X		X	

The number of hours of instruction provided yearly in each grade in each category is then calculated. For ease of computation a weight of .1 is assigned to each 100 hours of instruction. A table is then constructed which shows for each grade the total hours of instruction in each of the four categories (see Table 6).

The hours of instruction for each grade level in each subject category are then weighted by the expected life span of the behavioral capabilities acquired. Life-expectancy tables, compulsory retirement age, child labor laws, compulsory attendance laws, and total number of school grades offered are considered. For the educational enculturation category, maximum expected life is the total years of schooling available. For the national acculturation category maximum expected life is average life expectancy at birth. For the last two categories maximum expected life is average economic productive life. As an example, if in a particular country economic productive life is assumed to begin at 15 years of age and extends to a retirement age of 65, 40 years is the expected occupational productive life span. On this basis the curriculum hours in the last two categories for each year of schooling prior to age 15 would be multiplied by 40. For each succeeding year of education, average expected occupational life would decrease and the curriculum hours would be multiplied by successively smaller numbers (e.g., age 16, by 39; age 17, by 38; age 20, by 35; etc.).

The productive life-weighted curriculum hours are then summed across categories to produce a total for each grade level. This is the output weighting (last column in Table 6). Next the pass years for each grade in a given year are multiplied by the output weighting for that grade in that year. School leaving graduates and higher secondary graduates are weighted by the output weighting for the last year of school they completed.

TABLE 6
UNITED STATES
 INPUT/OUTPUT CURRICULUM WEIGHTING SCHEDULE

<u>Grade level</u>					<u>Grade* totals</u>	INPUT WEIGHTINGS	OUTPUT WEIGHTINGS
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>		<u>Cumulated grade totals</u>	
1	0.6	0.6	0.7	0.5	2.0	3.0	102.2
2	0.6	0.6	0.7	0.5	1.9	4.9	98.1
3	0.6	0.6	0.7	0.5	1.9	6.8	93.5
4	0.7	0.5	0.7	0.4	1.8	8.6	85.7
5	0.7	0.4	0.7	0.3	1.8	10.4	77.5
6	0.7	0.5	0.7	0.3	1.8	12.3	78.5
7	0.6	0.4	0.7	0.4	1.7	13.9	73.3
8	0.6	0.4	0.7	0.4	1.7	15.6	72.3
9	0.9	0.5	1.1	0.7	3.1	18.7	109.5
10	0.9	0.5	1.1	0.7	3.1	21.8	105.7
11	0.8	0.5	1.0	0.6	3.0	24.7	99.0
12	0.9	0.5	1.1	0.6	3.0	27.8	98.7
13	0.9	0.5	2.1	0.0	3.5	31.3	114.2
14	0.9	0.5	2.1	0.0	3.5	34.7	110.8
15	0.9	0.0	2.1	0.6	3.6	38.3	108.7
16	0.9	0.0	2.1	0.6	3.6	41.9	105.2
17	0.0	0.0	2.1	1.2	3.3	45.2	122.0
18	0.0	0.0	2.1	1.2	3.3	48.5	118.7
19	0.0	0.0	1.1	1.8	2.8	51.3	99.5

*Rounding errors accounts for slight differences between the grade total and the sum of its component development category curriculum hours. For a discussion of which categories are summed to produce grade totals see page 31.

318

It can be seen that improved health and sanitation, which increase average life expectancy, will result in increased educational output because of the added years of expected productive life. Total gross output then consists of the sum of the pass years (adjusted E II to XII)_{t+1} + school-leaving graduates_t + higher secondary graduates_t, weighted by content of instruction and expected productive life of the behavioral capabilities acquired.

For calculating inputs basic enrollment data, not converted into pass years, are used. Enrollment is weighted by content in the following manner. Curriculum hours are summed across the four development categories for each grade level. In Table 6 these sums are found in the "grade totals" column.¹ Input weighting at any grade level is the cumulation of grade totals through that grade. Thus if the grade totals for the first 6 grades are 2.0, 1.9, 1.9, 1.8, 1.8, and 1.8 (as in Table 6) the cumulated totals for those grades are 3.0,² 4.9, 6.8, 8.6, 10.4, and 12.3. These cumulated totals for each grade are then multiplied by the enrollment for the respective grades, and the sum of these weighted enrollments represents the student input.³

Teacher input is the product of number of teachers for each level and the minimum educational requirements (in number of years of schooling) for teachers.⁴ Total input in a given year is the sum of total student and total

¹For the first 15 years the occupational category is not included because opportunity costs for occupational behavior are non-existent until one is old enough to participate in the occupational system. After that time one is expending a year of occupational productive life and this category is therefore included.

²Each person starting in the educational system is counted as 1.

³Note that input is weighted only by curriculum while output is weighted by curriculum and life expectancy.

⁴Where data are available indicating the actual average length of teachers' schooling, this average is used rather than the legal minimum number of years of schooling required to teach.

259

teacher input for that year. This represents the total man years invested in the educational process in that year.


Net output can then be calculated by subtracting total input from gross output. This can be done for any level of education, for a type of school, or for the entire system. Net output is the contribution of the formal educational system to a nation's human capital stock in a given year.

Thus, for the total system, or various portions of it, input and output ratios can be calculated and trends in output over a number of years can be examined.

Illustration of Pass Year Method

Data resulting from the use of the pass-year method have been acquired for several countries. Illustrations of this approach, using data from the United States and Japan, are presented in the following tables.

Table 7 shows the student input and the teacher input in the United States for primary (elementary) education and secondary education. The combined student-teacher input for each level is also indicated. The student input is derived in the following manner: enrollment in each grade in each year is multiplied by the cumulated total grade level development category weights. The sums of these weighted enrollments over the appropriate grades (1-8 for primary; 9-12 for secondary; 1-12 for total) in each year are found in the table. The teacher input is derived as follows: the number of teachers in each level for each year is multiplied by the development weight of the minimum number of years of education required to teach at that level. The student-teacher input is simply the total of the separate student and teacher inputs. It is this input figure which is used to represent total pre-university input for a given year.



Obviously, these inputs will be affected by changes in any of their components. Student inputs will reflect changes in total enrollment, length of school attendance, or changes in curriculum (e.g., if more time is devoted to curricular areas which are weighted in all input content categories rather than one or two, student input will increase). Teacher inputs will reflect both changes in the numbers of teachers in service and the length of training required in order to teach. Total input will, of course, reflect changes in any of these components.

One trend observed in Table 7 is the drop in total input between 1940 and 1941. At this point total input declines rapidly to a low point of 262.7 in 1944, from which it recovers so slowly that the 1940 total input figure is not surpassed until 1952. Both teacher and student inputs follow this general pattern. Some of this drop may be accounted for by withdrawal of teachers from the educational system during the wartime mobilization. Inspection of the table indicates, however, that most of this input decline is accounted for by student inputs. Most likely this reflects lowered birth rates during the depression.

Table 8 presents pre-university output data for the U. S. Gross output is derived from the total pass-years for each grade in each year weighted by curriculum content and expected production life. Gross output per capita is simply gross output divided by total population. Net output is produced by subtracting student-teacher input (Table 7) from gross output. Net output per capita is net output divided by total population.

Gross output will be affected by changes in enrollment, length of schooling, or curriculum, just as student input is so affected. Gross output will also reflect changes in total or productive life expectancy and changes in numbers graduating from secondary education. The per capita

221

TABLE 7

UNITED STATES

INPUT FROM PRIMARY AND SECONDARY EDUCATION 1922-1963
(Millions of Weighted Pass Years)

<u>Years</u>	<u>Students</u>			<u>Teachers</u>			<u>Total</u>		
	<u>Prim.</u>	<u>Sec.</u>	<u>Total</u>	<u>Prim.</u>	<u>Sec.</u>	<u>Total</u>	<u>Prim.</u>	<u>Sec.</u>	<u>Total</u>
1922	126.1	53.7	179.8	18.9	5.5	24.4	144.9	59.3	204.2
1923	127.9	59.0	186.8	19.3	6.0	25.4	147.2	65.0	212.2
1924	125.6	64.2	189.8	19.7	6.6	26.3	145.3	70.8	216.1
1925	133.0	69.3	202.3	20.2	0.7	20.9	153.2	70.0	223.2
1926	132.8	71.7	204.5	21.9	8.0	29.9	154.7	79.6	234.4
1927	133.8	73.2	207.0	21.3	7.6	28.9	155.1	80.8	235.9
1928	134.8	74.7	209.5	20.6	7.3	27.9	155.4	82.0	237.4
1929	134.8	75.4	214.2	20.1	8.9	29.0	154.9	88.4	243.2
1930	134.8	84.2	219.0	20.5	9.2	29.7	155.3	93.3	248.6
1931	136.4	89.7	226.2	21.0	9.4	30.3	157.4	99.1	256.5
1932	136.9	103.7	240.6	20.7	9.2	29.9	157.6	112.9	270.5
1933	137.5	108.9	246.4	20.4	9.1	29.5	157.9	118.0	275.9
1934	137.0	111.7	248.8	20.7	9.2	29.9	157.7	121.0	278.7
1935	136.6	114.6	251.2	21.0	9.3	30.3	157.6	123.9	281.5
1936	135.0	117.6	252.6	28.4	9.5	37.9	163.4	127.1	290.5
1937	133.3	120.6	253.9	28.8	9.6	38.5	162.2	130.2	292.4
1938	131.0	124.5	255.6	25.0	12.5	37.6	156.1	137.0	293.1
1939	128.8	128.5	257.2	24.1	12.6	36.7	152.9	141.0	293.9
1940	127.1	131.0	258.1	24.7	12.4	37.1	151.9	143.4	295.3
1941	124.6	125.0	249.6	25.1	12.5	37.6	149.7	137.6	287.2
1942	123.0	119.4	242.4	24.6	12.3	36.9	147.6	131.7	279.3

.322

TABLE 7 (Continued)

<u>Years</u>	<u>Students</u>			<u>Teachers</u>			<u>Total</u>		
	<u>Prim.</u>	<u>Sec.</u>	<u>Total</u>	<u>Prim.</u>	<u>Sec.</u>	<u>Total</u>	<u>Prim.</u>	<u>Sec.</u>	<u>Total</u>
1943	120.1	107.9	228.0	24.1	12.1	36.2	144.3	119.9	264.2
1944	118.6	107.9	226.5	24.2	12.1	36.3	142.8	119.9	262.7
1945	117.5	108.9	226.5	24.2	12.1	36.3	141.7	121.0	262.8
1946	117.7	113.3	231.0	24.8	12.4	37.1	142.5	125.6	268.1
1947	120.1	109.8	230.0	25.3	12.7	38.0	145.4	122.5	267.9
1948	122.9	110.1	233.0	23.3	12.8	36.1	146.1	123.0	269.1
1949	126.3	111.2	237.5	24.7	13.6	38.3	151.1	124.8	275.8
1950	144.1	113.2	257.3	23.7	11.9	35.6	167.9	125.1	292.9
1951	136.7	114.6	251.3	28.3	14.1	42.4	164.9	128.7	293.6
1952	141.6	114.4	256.0	29.4	14.7	44.2	171.0	129.1	300.1
1953	146.2	122.6	268.8	30.6	15.3	46.0	176.9	137.9	314.8
1954	153.9	128.6	282.4	32.3	16.1	48.4	186.1	144.7	330.8
1955	159.8	134.4	294.2	33.9	16.9	50.8	193.6	151.3	345.0
1956	165.0	142.4	307.4	35.5	17.8	53.3	200.6	160.1	360.7
1957	169.6	152.9	322.5	37.2	18.6	55.8	206.8	171.5	378.4
1958	177.3	161.6	338.9	36.1	20.2	56.3	213.3	181.8	395.2
1959	186.9	168.0	354.9	34.9	21.8	56.8	221.9	189.8	411.7
1960	193.7	173.5	367.2	35.8	23.1	58.9	229.5	196.6	426.1
1961	194.0	186.0	380.0	36.8	24.3	61.1	230.8	210.3	441.1
1962	198.4	202.5	400.9	37.7	25.1	62.7	236.1	227.6	463.7
1963	203.2	219.8	423.0	38.6	28.8	67.4	241.8	248.6	490.4

223

TABLE 8

UNITED STATES

OUTPUT AND OUTPUT PER CAPITA FROM PRIMARY AND SECONDARY EDUCATION 1922-1963
(Millions of Weighted Pass Years)

Years	Gross Output			Gross Output Per Capita			Net Output			Net Output Per Capita		
	Prim.	Sec.	Total	Prim.	Sec.	Total	Prim.	Sec.	Total	Prim.	Sec.	Total
1922	1115.0	251.8	1366.8	10.1	2.3	12.4	970.1	192.5	1162.6	8.8	1.7	10.6
1923	1098.7	276.7	1375.4	9.8	2.5	12.3	951.5	211.7	1163.2	8.5	1.9	10.4
1924	1168.9	302.0	1470.9	10.2	2.6	12.9	1023.5	231.2	1254.8	9.0	2.0	11.0
1925	1164.6	313.4	1478.0	10.1	2.7	12.8	1011.4	243.4	1254.8	8.7	2.1	10.8
1926	1175.8	328.9	1504.8	10.0	2.8	12.8	1021.1	249.3	1270.4	8.7	2.1	10.8
1927	1188.5	345.4	1533.9	10.0	2.9	12.9	1033.5	264.6	1298.1	8.7	2.2	10.9
1928	1203.2	371.6	1574.8	10.0	3.1	13.1	1047.8	289.7	1337.5	8.7	2.4	11.1
1929	1216.4	398.1	1614.5	10.0	3.3	13.3	1061.5	309.7	1371.3	8.7	2.5	11.3
1930	1235.9	432.0	1667.9	10.0	3.5	13.6	1080.5	338.7	1419.3	8.8	2.8	11.5
1931	1233.3	497.2	1730.5	9.9	4.0	14.0	1075.9	398.1	1474.0	8.7	3.2	11.9
1932	1232.1	523.5	1755.6	9.9	4.2	14.1	1074.5	410.6	1485.0	8.6	3.3	11.9
1933	1220.8	537.3	1758.6	9.7	4.3	14.0	1063.0	410.8	1482.7	8.5	3.3	11.8
1934	1209.6	552.2	1761.8	9.6	4.4	13.9	1051.9	431.2	1483.1	8.3	3.4	11.7

TABLE 8 (Continued)

Years	Gross Output			Gross Output Per Capita			Net Output			Net Output Per Capita		
	Prim.	Sec.	Total	Prim.	Sec.	Total	Prim.	Sec.	Total	Prim.	Sec.	Total
1935	1201.5	571.6	1773.2	9.4	4.5	13.9	1043.9	447.8	1491.7	8.2	3.5	11.7
1936	1298.1	650.9	1949.0	10.1	5.1	15.2	1134.7	523.8	1658.5	8.8	4.1	12.9
1937	1278.4	676.7	1955.1	9.9	5.3	15.2	1116.2	546.5	1662.7	8.7	4.2	12.9
1938	1259.8	703.0	1962.9	9.7	5.4	15.1	1103.8	566.0	1669.7	8.5	4.4	12.9
1939	1230.1	715.6	1945.7	9.4	5.5	14.9	1077.3	574.5	1651.8	8.2	4.4	12.6
1940	1192.3	684.8	1877.2	9.0	5.2	14.2	1040.5	541.4	1581.9	7.9	4.1	11.9
1941	1171.0	656.8	1827.7	8.8	4.9	13.7	1021.3	519.2	1540.5	7.6	3.9	11.5
1942	1136.9	593.4	1730.3	8.4	4.4	12.9	989.4	461.7	1451.0	7.3	3.4	10.8
1943	1137.3	581.8	1719.1	8.4	4.3	12.7	993.1	461.9	1455.0	7.4	3.4	10.8
1944	1142.9	592.7	1375.6	8.5	4.4	13.0	1000.1	472.8	1472.9	7.5	3.5	11.0
1945	1158.8	620.2	1779.0	8.7	4.6	13.3	1017.1	499.2	1516.3	7.6	3.7	11.4
1946	1200.3	610.7	1811.0	8.5	4.3	12.9	1057.8	485.0	1542.9	7.5	3.4	11.0
1947	1249.1	619.8	1868.9	8.7	4.3	13.0	1103.7	497.3	1600.9	7.7	3.5	11.1
1948	1293.9	626.3	1920.3	8.8	4.3	13.1	1147.8	503.4	1651.2	7.8	3.4	11.3
1949	1420.8	633.6	2054.5	9.5	4.2	13.8	1269.8	508.9	1778.6	8.5	3.4	11.9

TABLE 8 (Continued)

Years	Gross Output			Gross Output Per Capita			Net Output			Net Output Per Capita		
	Prim.	Sec.	Total	Prim.	Sec.	Total	Prim.	Sec.	Total	Prim.	Sec.	Total
1950	1413.3	646.3	2059.6	9.3	4.3	13.6	1245.4	521.2	1766.7	8.2	3.4	11.6
1951	1455.6	649.9	2105.5	9.4	4.2	13.6	1290.7	521.2	1811.9	8.4	3.4	11.7
1952	1512.9	709.0	2221.9	9.6	4.5	14.2	1341.9	579.8	1921.7	8.5	3.7	12.2
1953	1615.9	731.2	2347.1	10.1	4.6	14.7	1439.1	593.2	2032.3	9.0	3.7	12.7
1954	1679.4	765.6	2445.0	10.3	4.7	15.1	1493.3	621.0	2114.2	9.2	3.8	13.0
1955	1729.0	809.9	2538.9	10.5	4.9	15.4	1535.4	658.5	2193.9	9.3	4.0	13.3
1956	1761.0	862.3	2623.3	10.5	5.1	15.6	1560.5	702.2	2262.6	9.3	4.2	13.5
1957	1836.4	916.3	2752.7	10.7	5.4	16.1	1629.6	744.8	2374.4	9.5	4.4	13.9
1958	1923.0	959.6	2882.6	11.0	5.5	16.5	1709.7	777.8	2487.4	9.8	4.4	14.2
1959	1986.0	1006.8	2992.8	11.2	5.7	16.8	1764.1	817.0	2581.1	9.9	4.6	14.5
1960	2010.5	1087.9	3098.5	11.2	6.0	17.2	1781.0	891.4	2672.3	9.9	5.0	14.8
1961	2065.1	1175.2	3240.2	11.3	6.4	17.7	1834.3	964.8	2799.1	10.0	5.3	15.3
1962	2124.6	1263.9	3388.5	11.4	6.8	18.2	1888.5	1036.3	2924.8	10.1	5.6	15.7
1963	2197.9	1339.4	3537.3	11.6	7.1	18.7	1956.1	1090.8	3046.9	10.3	5.8	16.1

figures will, of course, be influenced by changes in size of the total population as well as by educational changes.

The trends observed in the input figures are also evident in output, though less marked. Gross output begins falling a year earlier than input (1939) and recovers the full 1938 amount by 1949. Net output shows approximately the same pattern. Net output per capita, which drops in 1939, does not recover the 1938 level until 1954.

Table 9 presents the raw data from which input and output for higher education are calculated. The first column presents the total degree years; the second, degree years in science; and the third; degree years in "non-science." The "degree-year" is a modification of the pass-year concept designed to make it applicable to the peculiarities of higher education programs. Since year-by-year enrollments are seldom given for higher education, enrollments are estimated by projecting degrees obtained backwards. For example, if 6000 four-year degrees were awarded in 1964 in a particular country, it is assumed that at least 6000 students were in their third year of university studies in 1963, in their second year in 1962, and so forth. When all different types of degrees have been considered over a series of years, a table of estimated grade by grade enrollment results, which is used to calculate degree years in much the same way as pass years are calculated.

The category "science" includes the following areas of study: agriculture and forestry, architecture, dentistry, engineering, exact sciences, medicine, military, nursing and other health, pharmacy, and veterinary medicine. "Non-Science" includes arts and letters, business administration and commerce, economics, education, law, social and political sciences and religion. Clearly these two categories are not exhaustive, which explains why the sum of science and non-science degree years for a given year does not equal

TABLE 9

UNITED STATESHIGHER EDUCATION, 1922-1963
(Unweighted Degree Years)

<u>Year</u>	<u>Total</u>	<u>Science</u>	<u>*Non- Science</u>		<u>Year</u>	<u>Total</u>	<u>Science</u>	<u>*Non- Science</u>
1922	370374	98547	100966	:	1943	664168	NA	NA
1923	395801	99796	109786	:	1944	817126	"	"
1924	440480	100154	118961	:	1945	1058589	"	"
1925	479340	100987	132999	:	1946	1346322	"	"
1926	511723	101698	151480	:	1947	1512821	"	"
1927	554195	103860	173341	:	*	*	*	*
1928	566164	106926	200254	:	*	*	*	*
1929	579150	109489	222105	:	1950	1434442	435271	6986288
1930	595805	111382	238529	:	1951	1327839	393181	6928959
1931	607944	112942	242508	:	1952	1308254	381161	923051
1932	604435	111442	240222	:	1953	1344228	390360	948359
1933	600713	110847	236736	:	1954	1422640	412161	1000273
*	*	*	*	:	1955	1531138	446261	1070510
*	*	*	*	:	1956	1620597	474685	1127631
1936	735973	NA	NA	:	1957	1677545	489750	1166877
1937	770240	"	"	:	1958	1720717	503677	1199349
1938	795761	"	"	:	1959	1775526	512919	1247658
1939	780340	"	"	:	1960	1866111	533713	1320897
1940	721883	"	"	:	1961	1953887	6551071	1391356
1941	669434	"	"	:	1962	1677197	6696847	1119835
1942	617415	"	"	:	1963	1348422	6807565	821037

*Due to limitations of the computer used accurate assessment is not possible of the 13th and 14th year of a 14-year span.

NA - Sufficient data not available between 1936 and 1949.

328

total degree years. It is apparent that despite some rather dramatic year-to-year fluctuations, caused perhaps by vagaries in data reporting, the general trend in total unweighted degree years is a steady upward climb.

Table 10 presents the weighting schedules used to convert the unweighted degree years into input and output figures. First the curriculum hours in the four development categories are shown for each of the seven years of higher education.¹ The input weightings which are the cumulated grade level totals are also shown. These are simply the last seven rows of the sample input weighting schedule found on page 30 (Table 6). These input weightings were held constant over the total 42 year period. This is not the case with output weightings, however. As the table shows, the output weightings increased markedly in the last two 14 year periods.² Since curriculum hours by development category are held constant such an increase can only reflect increases in expected productive and total life. This illustrates how changes in life-span influence educational output, since the educational stock of each individual is usable for a greater number of years when life expectancy increases.

Table 11 presents the results obtained by combining the weighting schedules (Table 10) with the raw data (Table 9). The first three columns, showing input, were derived in the following manner: the estimated enrollment in each grade level in a given year was multiplied by the input weighting (cumulated grade level totals) appropriate to that year. The weighted enrollments were then summed over all seven grade levels to find total input for that year.

¹Seven years is the minimum time required to complete work for the highest available degree.

²Limitations of the computer used to calculate these data dictated the 14 year span.

329

TABLE 10

UNITED STATES

INPUT AND OUTPUT WEIGHTINGS: HIGHER EDUCATION

<u>Year of Study</u>	<u>Curriculum Hours by Context Category</u>				<u>Input Weightings</u>	
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>Grade level totals</u>	<u>Cumulated totals</u>
1st	0.9	0.5	2.1	0.0	3.5	31.3
2nd	0.9	0.5	2.1	0.0	3.5	34.7
3rd	0.9	0.0	2.1	0.6	3.6	38.3
4th	0.9	0.0	2.1	0.6	3.6	41.9
5th	0.0	0.0	2.1	1.2	3.3	45.2
6th	0.0	0.0	2.1	1.2	3.3	48.5
7th	0.0	0.0	1.1	1.8	2.8	51.3

Output Weightings

<u>Year of Study</u>	<u>1922-33 Grade level totals</u>	<u>1936-47 Grade level totals</u>	<u>1950-61 Grade level totals</u>
1st	114.2	126.9	129.0
2nd	110.8	123.4	125.5
3rd	108.7	122.2	122.2
4th	105.2	118.7	118.7
5th	122.0	138.5	138.5
6th	118.7	135.2	135.2
7th	99.5	113.8	113.8

2320

TABLE 11

UNITED STATES

INPUTS AND OUTPUTS FOR HIGHER EDUCATION, 1922-1961
(Millions of Weighted Degree-Years)

<u>Year</u>	<u>Input</u>			<u>Gross Output</u>			<u>Net Output</u>		
	<u>Total</u>	<u>Science</u>	<u>Non- Science</u>	<u>Total</u>	<u>Science</u>	<u>Non- Science</u>	<u>Total</u>	<u>Science</u>	<u>Non- Science</u>
1922	26.3	3.4	1.9	41.1	11.0	11.3	14.8	7.5	9.4
1923	27.9	3.5	2.0	43.9	11.1	12.2	16.0	7.6	10.2
1924	29.5	3.5	2.2	48.9	11.1	13.3	19.5	7.6	11.1
1925	1.1	3.6	2.3	53.2	11.2	14.8	22.1	7.7	12.5
1926	33.4	3.7	2.4	56.7	11.3	16.9	23.3	7.7	14.5
1927	35.9	3.8	2.6	61.4	11.6	19.3	25.5	7.8	16.8
1928	36.9	3.9	2.7	62.7	11.9	22.3	25.8	8.0	19.6
1929	38.1	4.0	2.8	64.1	12.2	24.7	26.1	8.2	21.9
1930	40.0	4.1	2.9	65.9	12.4	26.5	26.0	8.4	23.6
1931	40.7	6.9	11.7	67.3	12.6	26.9	26.6	5.6	15.1
1932	39.3	4.5	10.6	66.8	12.4	26.6	27.6	7.9	16.0
1933	37.9	4.2	10.1	66.4	12.3	26.2	28.5	8.1	16.1
1936	45.4	NA	NA	91.2	NA	NA	45.8	NA	NA
1937	48.0	"	"	95.4	"	"	47.4	"	"
1938	49.0	"	"	98.5	"	"	49.5	"	"
1939	49.9	"	"	96.5	"	"	46.6	"	"
1940	50.4	"	"	89.1	"	"	38.7	"	"
1941	50.7	"	"	82.7	"	"	32.0	"	"
1942	46.7	"	"	76.4	"	"	29.7	"	"
1943	43.0	"	"	82.5	"	"	39.6	"	"

331

TABLE 11 (Continued)

Year	Input			Gross Output			Net Output		
	Total	Science	Non-Science	Total	Science	Non-Science	Total	Science	Non-Science
1944	51.0	NA	NA	101.7	NA	NA	50.7	NA	NA
1945	59.4	"	"	131.8	"	"	72.4	"	"
1946	73.7	"	"	167.2	"	"	93.5	"	"
1947	84.1	"	"	187.4	"	"	103.2	"	"
1950	85.1	11.5	105.7	178.7	54.2	953.9	93.6	42.7	848.2
1951	79.1	11.2	124.6	165.7	49.0	927.1	86.5	37.9	802.5
1952	80.1	11.3	19.5	163.4	47.6	115.3	83.3	36.3	95.8
1953	83.3	11.8	19.7	168.1	48.9	118.5	84.7	37.0	98.8
1954	90.4	2.4	5.5	178.0	51.6	125.0	87.5	49.2	119.5
1955	97.7	2.6	6.0	191.4	55.8	133.7	93.6	53.2	127.7
1956	106.9	2.8	6.4	202.4	59.3	140.8	95.4	56.6	134.4
1957	112.0	2.9	6.8	209.4	61.2	145.6	97.3	58.2	138.8
1958	118.5	3.1	6.9	214.7	62.9	149.6	96.3	59.8	142.7
1959	123.4	3.1	7.1	221.7	64.1	155.8	98.3	60.9	148.7
1960	130.7	3.2	7.4	233.4	66.8	165.2	102.7	63.6	157.8
1961	140.3	3.4	7.9	244.3	843.0	173.9	104.0	839.6	166.0

NA = Sufficient data not available between 1936 and 1949.

222

The second three columns, showing gross output, were produced by multiplying degree years for each grade level in a given year by the output weighting appropriate to that grade level in that year. These were then summed over all seven grade levels to find total gross output. Identical procedures were used for finding output and gross output for the science and non-science categories, using the enrollment and degree-year figures for these categories. Net output was calculated by subtracting input from gross output.

Net output from higher education falls in the late 1930s and early 1940s, as did pre-university output, but recovers much more quickly, greatly surpassing pre-1940 levels by the end of the Second World War. This drop in output during the war years is almost certainly the direct result of military manpower requirements during that time. The dramatic increase in output in the immediately post-war years reflects the impact of the "G.I. Bill" which provided free education for returning veterans. The slight dropoff in output in the early 1950s may reflect the military manpower requirements during the Korean conflict. Higher education output then appears to reflect directly the impact on the educational system of changes in the rest of the society.

Tables 7-11 have been presented to demonstrate how the pass-year measure can be used to build, piece by piece, a picture of the total educational system of a country, and to illustrate and clarify the various steps in the process. Table 12 gives a complete picture of the Japanese school system for the years 1950-1963. Inputs and outputs for all four levels (primary, intermediate, secondary and higher) are shown, as well as totals for each year.

231

TABLE 12

JAPAN

INPUT, GROSS OUTPUT AND NET OUTPUT, 1950-1963

(Millions of Weighted Pass Years)

<u>Year</u>	<u>Input</u>					<u>Gross Output</u>				
	<u>Prim.</u>	<u>Int.</u>	<u>Sec.</u>	<u>Higher</u>	<u>Total</u>	<u>Prim.</u>	<u>Int.</u>	<u>Sec.</u>	<u>Higher</u>	<u>Total</u>
1950	65.4	75.6	42.6	13.2	196.8	687.5	435.1	196.4	11.0	1330.0
1951	68.5	76.5	52.3	13.7	213.0	697.2	424.3	198.0	9.8	1329.3
1952	70.5	75.8	49.9	14.8	211.1	668.3	440.4	210.2	14.3	1333.2
1953	70.3	76.8	53.4	15.5	216.1	661.2	461.7	215.8	14.3	1353.0
1954	69.5	83.0	53.7	16.3	222.4	697.0	482.9	217.6	15.6	1413.1
1955	70.3	87.1	53.5	17.2	228.1	724.3	496.6	227.9	16.9	1465.7
1956	70.6	88.3	55.5	17.8	232.2	767.1	482.0	241.3	17.5	1507.9
1957	74.0	85.0	59.9	18.1	237.0	827.6	436.1	255.5	17.5	1536.7
1958	82.5	78.7	63.5	18.5	243.2	831.8	437.9	270.6	17.7	1558.0
1959	85.5	76.9	66.7	19.2	248.3	784.2	483.1	277.4	18.2	1562.9
1960	81.5	85.5	67.4	18.3	252.7	733.0	539.7	270.8	18.4	1562.0
1961	76.7	101.5	65.7	21.7	265.6	680.7	581.7	284.7	19.2	1566.3
1962	71.4	108.7	68.2	23.5	271.9	642.2	562.9	327.7	20.2	1553.1
1963	67.6	104.1	80.4	25.6	277.7	614.0	522.5	320.0	20.7	1477.2

2334

TABLE 12 (Continued)

<u>Year</u>	<u>Net Output</u>				
	<u>Prim.</u>	<u>Int.</u>	<u>Sec.</u>	<u>Higher</u>	<u>Total</u>
1950	622.1	359.5	153.8	-2.2	1133.2
1951	628.7	347.8	145.7	-3.9	1118.3
1952	597.8	364.6	160.3	-0.5	1122.2
1953	590.8	384.9	162.4	-1.2	1136.9
1954	627.5	399.9	163.9	-0.8	1190.5
1955	654.0	409.5	174.4	-0.3	1237.7
1956	696.5	393.7	185.8	-0.3	1275.6
1957	753.7	351.1	195.6	-0.6	1299.8
1958	749.3	359.2	207.1	-0.8	1314.8
1959	698.7	406.2	210.7	-1.0	1314.6
1960	651.5	454.3	203.4	-0.1	1309.3
1961	604.0	480.2	219.0	-2.5	1300.7
1962	570.7	454.2	259.5	-3.4	1281.0
1963	546.3	418.4	239.6	-4.9	1199.4

335

Some patterns in these inputs and outputs can be observed. For example, in nearly all of these years net output from higher education was negative. If the data used were accurate, this means that Japan's higher educational efforts are resulting in a net loss in human capital stock. Possibly reflected, however, is the fact that post graduate degrees are frequently missing from Japanese statistics on higher education. This may also reflect the existence of part-time students, whose presence would inflate input figures while not altering output figures. Further, teacher input at the higher education level tends to be overestimated since university professors frequently are employed in non-university jobs. The decline in primary input and output in recent years probably reflects the post World War II drop in birth rate.¹

A Preliminary Comparison of the Pass-Years and Pupil-Hours Measures

The pass-year measure clearly takes into account many more factors than does the pupil-hour measure. The pupil-hour approach produces essentially only one type of measure: a number which represents, for the whole educational system or some portion of it, the total amount of pupil exposure to one or another category of content. From the pass-year technique one can get the same information, more or less, in total pass-years weighted by the four content categories. But, in addition, one can get, at various stages of the analysis: a measure of the manpower invested in teaching; a measure of the total output, including both graduates from each level and school-leavers from each grade, all weighted by the life expectancy of the behavior acquired;

¹In all of these examples it would aid explanation considerably if output figures were standardized demographically, by using the population of appropriate age cohorts. Thus, changes in the population distribution, which certainly affect these educational measures, could be accounted for. Age-specific population figures, however, are for most countries grossly inaccurate -- even less reliable than enrollment data or total population data (see Chapter 7).

and a measure of net output which indicates whether there is any net gain in human capital stock resulting from the educational effort. This last measure, to the extent to which it is valid, is a particularly useful measure to have both for planning and for the study of development, and is the final aim of the pass-year measurement technique. If one finds, as in Indonesia, for example, that the educational effort at one level or another, or totally, produces a net loss in human capital stock, one can then question seriously the desirability of existing educational arrangements, and, by examining the data, try to pinpoint the causes of this loss.

This does not mean that in all cases the pass-year measure is the best technique to use. The availability of data and time involved are important considerations. The pupil-hour measure requires only the number of pupils enrolled by level of education in any given year and a good curriculum outline, both of which are usually readily available, particularly to the planner or analyst working in a country. The pass-year approach, on the other hand, requires grade-by-grade enrollment figures for a number of contiguous years. In addition it demands: a count of the number of teachers at each level, as well as the minimum educational requirements for teachers; the percentage of repeaters in each grade for each year (or a good estimate thereof); the number of graduates from each level; and the percentage of attendance in each grade.

For higher education the requirements are: year-by-year enrollment, number of degrees granted, and size of the teaching force, each categorized by field of study. Also needed is information on required curriculum and length of study for different degrees. Experience has shown that the curricular information and number of degrees granted are particularly difficult to find.

Such detailed data as are required by the pass-year measure are often unavailable (although increasingly less so as data collection improves in developing countries), particularly to the analyst who does not have immediate access to the government archives for each country to be studied. Even the planner or analyst working in a country, and having such access, will sometimes have difficulty getting information on the less developed nations for any but the most recent years, making it impossible to use this measure to trace patterns of growth and change over long periods of time. Thus, in some countries, the pupil-hour measure may be more desirable in spite of the fact that it produces less information, simply because it is more practicable.

The matter of practicability is a rather important criterion in judging these measures because they are similar in what they attempt to assess and the assumptions they require. In essence, each attempts to refine traditional enrollment or graduates measures primarily by considering which kinds of content are studied how long. Both also share the same three basic assumptions:

1. What is taught may be inferred from what is prescribed in curriculum regulations or specifications.
2. There is a fairly direct correspondence between what is taught and what is learned.
3. There is a fairly direct correspondence between what is taught and behavioral capabilities acquired (by many definitions of learning this is tautologous with 2 above).

All of these assumptions are clearly rather tenuous. Perhaps the weakest link in the chain of reasoning supporting these measures is the implicit assumption that identifiable cognitive learnings provide the most direct and important influence on later behavior. This obscures the fact that much important learning (and consequent behavior change) is not a direct result

338

of the content of class lessons, but results rather from social interactions among students and between students and teachers, from teachers' attitudes toward such content and the students themselves, from teaching methods employed, from the simple fact of having been to school, and so forth.

Nevertheless, these two measures do provide a clearer (or at least a fuller) picture of the educational process in that they include parameters not taken into account by such standard educational measures as enrollment, number of teachers, graduates by level and such. The crucial test of the utility of the pass year or pupil hour measures, relative to the simpler and more standard measures, is to compare the results obtained when using the different measures. In this way it may be determined whether the more complex measures do in "real life" provide clearer insights into the interactions between education and other social phenomena, or present a more precise picture of the internal relationships among parts of the educational system itself. The following chapter is devoted to such comparisons.

2329

CHAPTER 9

MEASURING EDUCATIONAL OUTPUT - II

The preceding chapter has made clear that use of either of the two new measures proposed will involve considerably more effort than will the use of such traditional educational measures as enrollments, graduates, or numbers of teachers. Therefore, it becomes important to determine whether the results justify the effort. It might be concluded that since the proposed measures take account of more information than enrollment data they are by definition superior to traditional measures.

The question is more subtle, however, for it must be determined:

(1) if the pupil hour and pass year measures give different results than traditional educational indicators, and (2) for what purposes the differences obtained are significant. In empirically comparing the pass year measure¹ with standard educational measures, two questions are relevant:

(1) Does the pass year measure provide a different "picture" in examining the growth of an educational system, or portions of it, over time in a single country? and (2) Does it relate differently to various extra-educational social measures?

Analysis of Educational Growth

To attempt to answer the first question the growth curves of various levels of the educational systems in Japan, the United States and Indonesia are compared using both enrollment figures and pass year net output (Tables 1, 2, 3). The growth curve of pass year net output is, at every

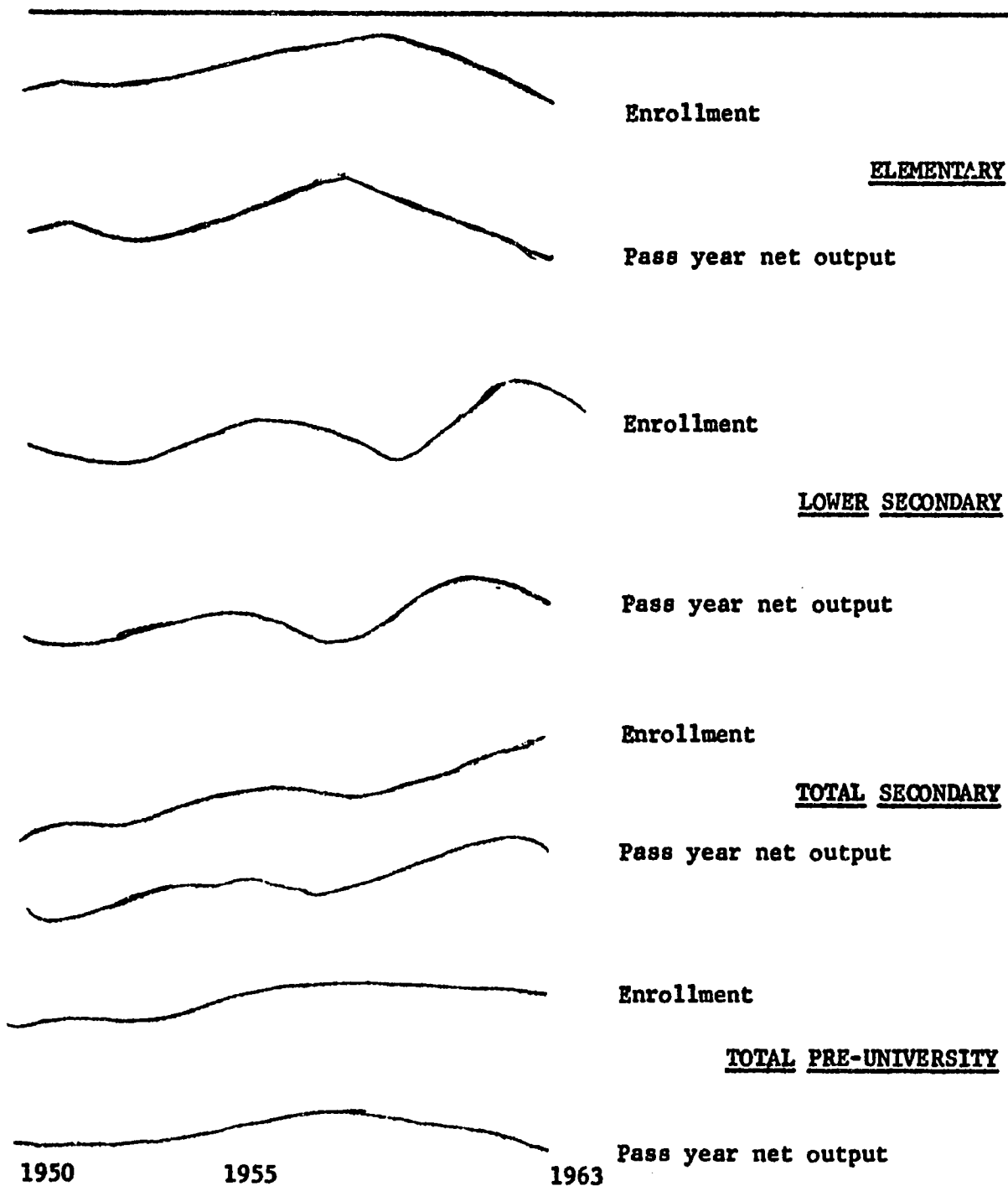
¹As the pupil hour measure has thus far been applied in only a few countries (and generally only at decade intervals) it was not possible to use it for worthwhile comparisons with other measures.

TABLE 1

JAPAN

COMPARISON OF PRE-UNIVERSITY GROWTH CURVES (1950-1963)

USING ENROLLMENT AND PASS YEAR NET OUTPUT



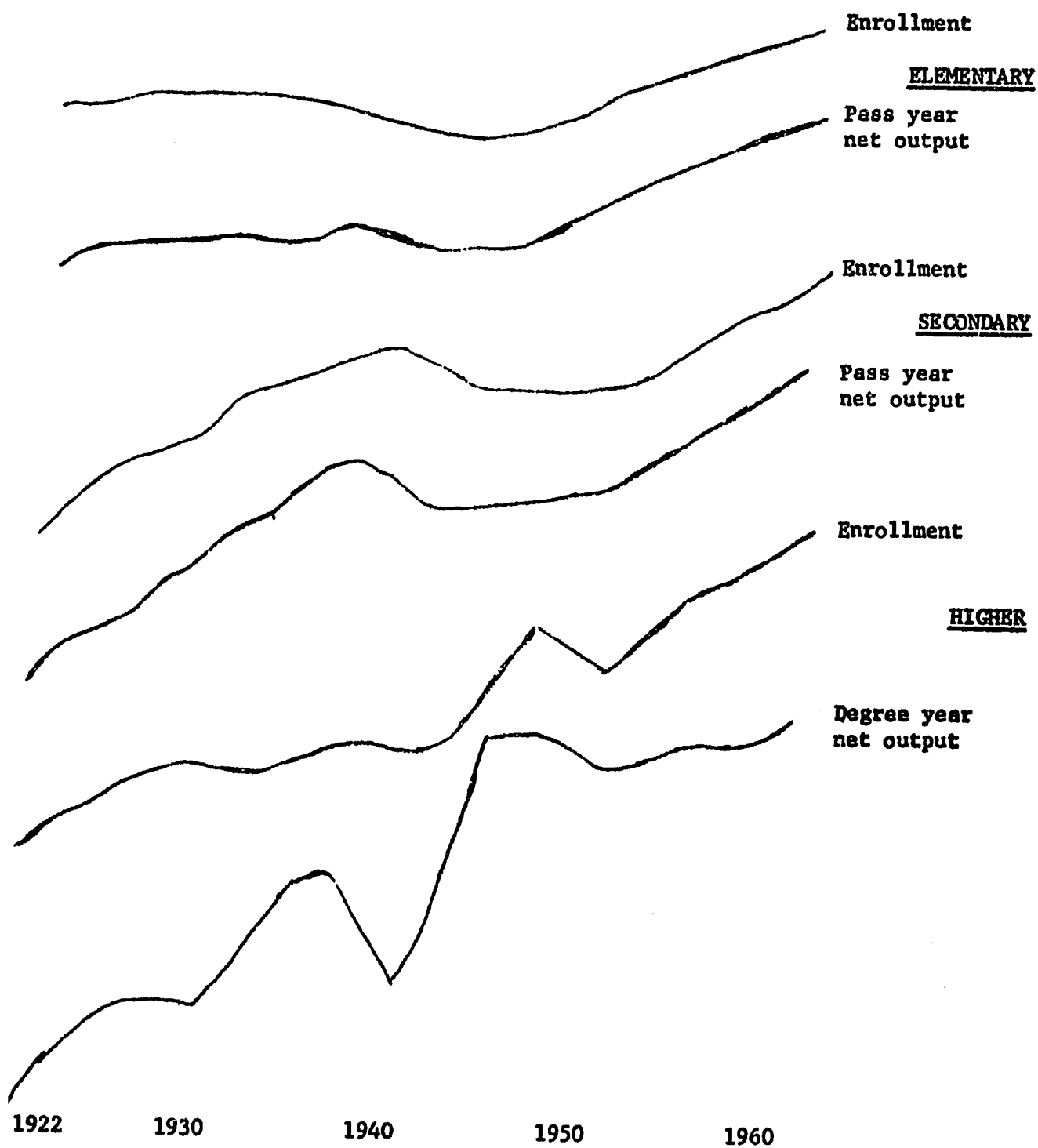
341

TABLE 2

UNITED STATES

COMPARISON OF EDUCATIONAL GROWTH CURVES (1922-1962)

USING ENROLLMENT AND PASS (DEGREE) YEAR NET OUTPUT



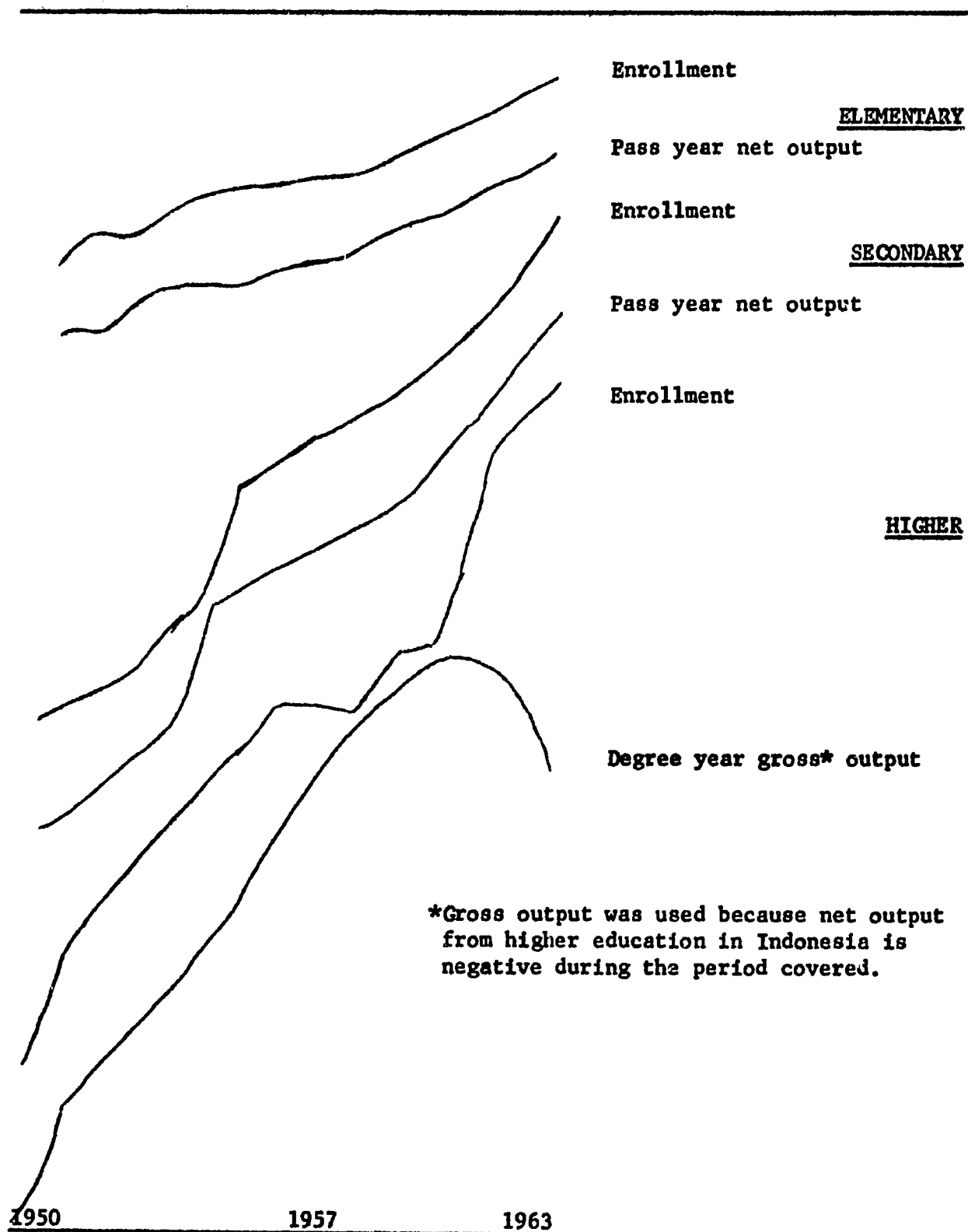
342

TABLE 3

INDONESIA

COMPARISON OF EDUCATIONAL GROWTH CURVES (1950-1963)

USING ENROLLMENT AND PASS (DEGREE) YEAR NET OUTPUT



342

level in each country, different from the enrollment growth curve. The smallest differences are found in Japan which is not surprising since a small time-span is covered (13 years); and during this time there were no major changes either in curriculum or length of attendance, or in any of the other non-enrollment parameters. Changes in enrollment would therefore be expected, in this case, to be reflected in the pass year net output curve. The small differences in the two curves at every level are no doubt due to the minor changes in curriculum, average length of schooling, number of teachers and graduates, etc., which inevitably occur from year to year in an educational system.

At all three levels in the U. S. the pass year growth curve is steeper than the enrollment curve; that is, enrollment increments were creating more than proportional increments in net human capital stock being produced by education. This phenomenon is probably a reflection both of greatly increased life expectancy over the 42 year period covered, and increased average length of school attendance.

Although a relatively short time span is considered for Indonesia there are marked differences in the growth curves, at the secondary and higher levels. This indicates dramatic changes in almost all of the parameters of the pass year measure, including enrollment. Thus, when many of the other relevant dimensions are considered, as the pass year measure attempts to do, the picture that one gets of growth and change in a country is different (in some cases very different) from that presented by enrollment figures alone.

Another perspective may be acquired by examining the correlations between enrollment and net pass year output at each level of education within the three countries (Table 4). The coefficients found in this table make

TABLE 4
CORRELATIONS BETWEEN PASS YEAR NET OUTPUT PER CAPITA
AND ENROLLMENT PER CAPITA BY EDUCATIONAL LEVEL:
JAPAN, THE UNITED STATES, AND INDONESIA

Net primary output per capita to primary enrollment per capita:

USA (1922-35)	.63
USA (1936-49)	.74
USA (1950-63)	.96
Japan (1950-63)	.95
Indonesia (1950-63)	.98

Net secondary output per capita to secondary enrollment per capita:

USA (1922-35)	.98
USA (1936-49)	.88
USA (1950-63)	.99
Japan (1950-63)	.80
Indonesia (1950-63)	.52

Net higher output per capita to higher enrollment per capita:

USA (1922-35)	.89
USA (1936-49)	.40
USA (1950-63)	.65
Japan (1950-63)	-.37
Indonesia (1950-63)	-.86

Net total output per capita to total enrollment per capita:

USA (1922-35)	-.50
USA (1936-49)	.75
USA (1950-63)	.99
Japan (1950-63)	.86
Indonesia (1950-63)	.98

Net secondary output per capita to higher secondary graduates per capita:

USA (1922-35)	.98
USA (1936-49)	.80
USA (1950-63)	.94
Japan (1950-63)	.79
Indonesia (1950-63)	.61

Net higher output per capita to higher graduates per capita:

USA (1922-35)	.91
USA (1936-49)	-.04
USA (1950-63)	-.60
Japan (1950-63)	-.73
Indonesia (1950-63)	-.60

BKS

apparent what visual inspection of the growth curves suggested: that although the relationships are sometimes quite high they are in no case perfect, and are in some cases rather low or even strongly inverse. Further support therefore is lent to the generalization that when the pass year measure is used for within-country intra-sectoral analysis of educational growth, the results can be quite different than when enrollment data are used.

Interaction of Educational and Social Indicators

The second question asked above is whether these various types of educational measures produce different results when correlated with other social indicators. In order to answer this question, pass year net output per capita for various levels was correlated by using the Pearson product-moment correlation coefficient¹ with eleven social indicators, using data from the United States (1922-1963), Japan (1950-1963) and Indonesia (1950-1963). The results were then compared with the relationships obtained when using enrollment per capita and graduates per capita by level. The following social indicators were used for this analysis: GNP per capita, agricultural sector GNP/agricultural labor force, urban population/total population, percentage of eligible voters participating in elections, hospital beds per 1000 population, calories consumed per day per capita, telephones per 1000 population, newspaper circulation per 1000 population, number of families with radios, millions of kilowatt hours of electrical power generated per million population, urban population. Table 5 presents the results of these computations.²

¹Separate coefficients were calculated for 14 year spans in each country (3 such spans for the U.S., 1 each for Japan and Indonesia). This arrangement gives a measure of the extent to which two variables tend to co-vary over the time period covered.

²The correlations presented in Table 5 are a small part of a much larger study being conducted by Kenneth Neff. Eventually similar correlations will be computed between 28 educational measures and 45 social indicators in 18 countries.

-246-

TABLE 5

PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS RELATING SELECTED
SOCIAL INDICATORS WITH BOTH PASS YEAR NET OUTPUT PER CAPITA
AND STANDARD ENROLLMENT AND GRADUATES MEASURES:

USA, JAPAN, AND INDONESIA

	GNP per capita	Agricultural GNP/agri-cultural labor force	Urban population/total population	Participation in elections	Hospital beds/1000 population	Calories consumed per day per capita	Telephones/1000 population	Newspaper circulation per 1000 population	Number of families with radios	Millions KWH electric power generated	Urban population
USA 1922-35											
Educ. output/capita											
primary	-.61	-.41	-.46	-.50	-.60	.83	.41	.17	-.66	-.32	-.53
secondary	-.82	.70	.92	.13	.95	-.82	-.08	.12	.99	.65	.95
higher	-.28	.79	.88	-.21	.65	-.30	.56	.64	.83	.68	.91
total	-.71	.71	.93	-.08	.86	-.59	.15	.27	.90	.67	.93
Enrollment/capita											
primary	.73	-.49	-.88	-.16	.95	.83	.87	-.26	-.97	-.77	-.93
secondary	-.82	.55	.87	.20	.95	-.88	-.20	.12	.98	.68	.92
higher	-.32	.53	.89	.05	.73	-.43	.47	.75	.82	.97	.90
Graduates/capita											
higher second.	-.74	.61	.95	.17	.95	-.79	.01	.32	.99	.80	.98
higher educ.	-.55	.71	.95	.06	.78	-.51	.32	.54	.88	.84	.95
USA 1936-49											
Educ. output/capita											
primary	-.58	-.47	-.46	-.72	-.72	-.53	-.31	-.38	-.45	-.59	-.37
secondary	-.90	-.86	-.79	-.64	-.54	-.09	-.79	.77	-.80	-.90	-.82
higher	.37	.48	.48	-.37	.22	-.16	.26	.55	.24	.27	.36
total	-.69	-.57	-.52	-.89	-.64	-.34	-.50	.45	-.59	-.72	-.51
Enrollment/capita											
primary	-.85	-.84	-.80	-.66	-.56	.03	-.74	-.76	-.82	-.84	-.78
secondary	-.97	-.95	-.94	-.31	-.43	.43	-.90	-.91	-.89	-.94	-.94
higher	.69	.83	.74	.21	-.09	-.68	.87	.79	.82	.65	.86
Graduates/capita											
higher second.	-.89	-.89	-.86	-.14	-.31	.52	-.86	.85	-.81	-.86	-.89
higher educ.	.50	.61	.47	.21	-.38	-.72	.81	.46	.73	.57	.73

347

TABLE 5 (Continued)

	GNP per capita	Agricultural GNP/agricultural labor force	Urban population/total population	Participation in elections	Hospital beds/1000 population	Calories consumed per day per capita	Telephones/1000 population	Newspaper circulation per 1000 population	Number of families with radios	Millions KWH electric power generated	Urban population
USA 1950-63											
Educ. output/capita											
primary	.95	.68	.99	.89	.85	.81	.97	.96	.99	.97	.98
secondary	.97	.83	.96	.84	.86	.76	.98	.96	.94	.96	.98
higher	-.65	-.78	-.53	-.47	.41	.54	-.58	.70	-.50	.57	-.58
total	.96	.73	.99	.87	.89	.78	.99	.96	.99	.98	.99
Enrollment/capita											
primary	.88	.63	.95	.83	.91	.71	.94	.90	.97	.95	.95
secondary	.97	.87	.95	.80	.89	.79	.98	.96	.93	.96	.98
higher	.94	.84	.92	.76	.87	.72	.95	.91	.90	.92	.95
Graduates/capita											
higher/second.	.93	.85	.88	.77	.79	.69	.91	.91	.85	.87	.91
higher educ.	.63	.76	.55	.30	.73	.33	.67	.61	.52	.59	.63
Japan 1950-1963											
Educ. output/capita											
primary	-.66	-.48	.32	NA	-.37	-.35	-.62	.17	-.49	-.63	-.33
secondary	.82	.88	.61	"	.74	.72	.81	.72	.76	.82	.62
higher	-.26	-.31	-.73	"	-.47	-.44	.33	.55	-.42	-.22	.71
total	-.17	.30	.77	"	.17	.19	-.11	.58	.05	-.12	.79
Enrollment/capita											
primary	-.73	-.38	.61	"	-.31	-.41	-.69	-.08	-.46	-.69	.63
secondary	.95	.89	.71	"	.79	.82	.93	.76	.88	.93	.70
higher	.99	.99	.99	"	.92	.84	.99	.91	.97	.98	.99
Graduates/capita											
higher second.	.73	.94	.96	"	.92	.82	.75	.90	.82	.75	.96
higher educ.	.88	.84	.89	"	.92	.88	.90	.94	.92	.87	.88

TABLE 5 (Continued)

	GNP per capita	Agricultural GNP/agri-cultural labor force	Urban population/total population	Participation in elections	Hospital beds/1000 population	Calories consumed per day per capita	Telephones/1000 population	Newspaper circulation per 1000 population	Number of families with radios	Millions KWH electric power generated	Urban population
Indonesia 1950-63											
Educ. output/capita											
primary	.92	1.00	NA	NA	.17	NA	.97	.07	.93	.92	NA
secondary	.96	.99	"	"	.25	"	.63	.15	.95	.94	"
higher	-.49	-1.00	"	"	.00	"	-.75	-.01	-.59	-.70	"
total	.94	1.00	"	"	.17	"	.97	.09	.94	.93	"
Enrollment/capita											
primary	.89	.99	"	"	.16	"	.98	.13	.95	.93	"
secondary	.99	.99	"	"	.09	"	.96	.25	.95	.97	"
higher	.98	.99	"	"	-.05	"	.89	.01	.82	.80	"
Graduates/capita											
higher second.	.76	.41	"	"	.25	"	.84	.24	.80	.78	"
higher educ.	.96	1.00	"	"	.00	"	.83	.84	.87	.89	"

NA = Data unavailable.

It is apparent that use of the pass year measure in such an analysis generally produces rather different results than those obtained when using enrollment or graduates. In some cases related measures produce quite similar results. For example, educational output per capita and enrollment per capita at the primary level relate identically ($r=.83$) to calories consumed per day per capita in the United States (1922-35); also educational output per capita and enrollment per capita at the secondary level relate

349

identically ($r=.97$) to GNP per capita in the United States (1950-63).

Inspection of Table 5 shows a number of other instances where enrollment and pass year net output at the same level of education relate in quite a similar fashion to the social and economic indicators.

There are also, however, a large number of cases where these educational measures do not relate similarly to other social measures. Indeed, in some cases the difference is quite extreme. For example, educational output per capita at the secondary level relates strongly and positively ($r=.77$) to newspaper circulation in the U. S. (1936-49) while secondary enrollment per capita relates very strongly and negatively ($r=-.99$) to the same measure during the same time. In addition, it should be noted that the pass year net output measure produces results much more similar to those obtained when using enrollment data than when using numbers of graduates. This is significant in view of the fact that number of graduates is a very commonly used measure of educational output.

Since only three countries have been included in the analysis just presented it is impossible to make generalizations about the patterns of relationships between education and the social indicators used. It is apparent that these relationships are not stable, either from country to country, or within a single country over a long time span. For example, the relation between total educational output per capita and the telephones measure (telephones, it will be remembered, were considered by Caplow and Finsterbusch, see Chapter 7, to be the best available single indicator of modernization). In the U. S., this correlation varies from .15 (1922-35) to -.50 (1936-49) to .99 (1950-63), while it is -.11 in Japan and .97 in Indonesia. Also, the correlation between primary education output per capita and electric power generation ranges from -.63 (Japan) to .92

(Indonesia). Numerous similar examples of wide variation in correlations can be found which should warn the analyst to be cautious about applying the experience of one country to the problems of another. For instance, the relations which held in Indonesia from 1950-1963, as shown in Table 5, bear closer resemblance to those found in the U. S. during that same time than to those found in Indonesia's Asian neighbor, Japan.

When this analysis is extended to include many more countries it may well be possible to distinguish "families" of nations where there exist the same kinds of relationships between education and social changes. As has been mentioned in several contexts earlier, it is within such carefully delineated "families" that analyses of educational development and comparative study (and hence cross national generalization) will be most fruitful.

By calculating correlations for various time spans within a single country, as has been done with the U. S., an examination can be made of the changing relationships between education and other social phenomena as the total social context changes; or by disaggregating the educational measure, the changing influences of different educational levels and sectors can be appraised. For example, between 1936 and 1949 in the United States the majority (66 percent) of the relationships shown in Table 5 are negative, as compared to the previous and succeeding time spans, when negative correlations comprise 31 percent and 30 percent of the matrices respectively. The marked change in many of the relationships during the period 1936-1949 seems to reflect a drop in enrollment which occurred during this time at all levels of formal education, influenced both by a lowered birth rate in the late twenties and early thirties and by the impact of the depression and World War II on the secondary and higher education manpower pool. What the educational measures used do not reflect is the great amount of out-of-school

251

education occurring in this period, carried on by such agencies as the Civilian Conservation Corps during the depression and by the armed services during the War. This informal education is accounted for by a refinement of the pass year approach which uses census data to assess the total educational stock of a nation. The resultant measure, total human capital stock per capita, was related to each of the social indicators used in Table 5 for the last two time spans in the U. S. These correlations were then compared to the results obtained when total educational output per capita was used (Table 6). It is apparent that when informal education is assessed for the earlier period there is a dramatic change in the relationships, indicating the relative importance of these non-school educational opportunities during this time. During the later period however there is almost no change, indicating that the relative importance of informal educational channels had declined considerably. In those cases where a considerable amount of out-of-school training and education is taking place, it is probably advisable, for purposes of relating education to development, to use the human capital stock indicators in conjunction with the pass year measures.

352

TABLE 6

COMPARISON OF RELATIONSHIPS OF SELECTED SOCIAL INDICATORS
TO BOTH TOTAL EDUCATIONAL OUTPUT PER CAPITA
AND TOTAL HUMAN CAPITAL STOCK PER CAPITA: USA 1936-49 and 1950-63

	GNP per capita	Agricultural GNP/agri-cultural labor force	Urban population/total population	Participation in elections	Hospital beds/1000 population	Calories consumed per day per capita	Telephones/1000 population	Newspaper circulation per 1000 population	Number of families with radios	Millions KWH electric power generated	Urban population
<u>USA 1936-49</u>											
Educ. output/capita total	-.69	-.57	-.52	-.89	-.64	-.34	-.50	.45	-.59	-.72	-.51
Human capital stock per capita--total	.93	.85	.92	.56	.69	-.08	.82	.84	.92	.94	.88

<u>USA 1950-63</u>											
Educ. output/capita total	.96	.73	.99	.87	-.89	-.78	.99	-.96	.96	.98	.99
Human capital stock per capita--total	.98	.79	.98	.85	-.87	-.80	.99	-.98	.97	.98	.99

253

Summary

In the preceding pages it has been demonstrated that the pass year measure often produces analytic results quite dissimilar from those obtained when using traditional educational measures. Some of the preliminary results of a large scale cross-national study using time-series for the pass year measure and a number of other educational and social indicators have also been presented and briefly discussed. The limits to the utility of the two measures proposed in the preceding chapter, and the particular conditions under which they will prove more or less useful than the more standard measures, remain to be determined, for neither measure has been applied in a sufficiently wide range of cases to allow such judgments to be made. Nevertheless, this and the preceding chapter should make it clear that these new measures hold considerable promise in the analysis of education and development.

Chapter 10

USE OF SCALOGRAM ANALYSIS IN THE MEASUREMENT OF DEVELOPMENT

One point the preceding chapters have demonstrated is that only inadequate techniques have been devised to date for measuring educational development. This realization has led to exploration with scalogram analysis, a technique developed during the Second World War by Louis Guttman and since improved by a number of workers. Originally devised for the study of attitudes, scalogram analysis has been found to be of even greater value for the study of social objects.

Since reasonably good discussions can be found elsewhere of the theoretical and procedural considerations of scalogram analysis these need not be elaborated upon here.¹ Rather a brief, general description of the technique is offered and an examination is made of its usefulness for analysis and planning of educational development.

The data needed for the use of scalogram analysis for the purposes of this chapter are a sample of societies and a set of items or traits, usually dichotomized into presence-absence categories. (Scaling can be done using more complex differentiations than dichotomies, but the dichotomy is the simplest, and in many ways, the most useful case.) A matrix of the variables is formed and the data rearranged until a pattern is evident. If such a pattern meets certain formal requirements, a scale is said to have been found. It should not be concluded, however, that the emergence

¹Allen Edwards, Techniques of Attitude Scale Construction, New York, Appleton Century Crofts, 1957; Leo Goodman, "Simple Statistical Methods for Scalogram Analysis," Psychometrika, 24, March, 1959; Herbert Menzel, "A New Coefficient for Scalogram Analysis," Public Opinion Quarterly, 17 (2), September, 1953; Warren Torgerson, Theory and Methods of Scaling, New York, Wiley, 1958; and Frank W. Young, Initiation Ceremonies, New York, Bobbs-Merrill Company, Inc., 1965 (Particularly Chapter 3 "Method of Study").

255

of a scale can be an artifact of the manipulation. A scale pattern is either inherent within the data or it is not. The rearrangement of data merely brings it out. A manufactured example can illustrate this point.

In the matrix below are noted the presence (X) or absence (0) of 14 traits or institutions (1...14) for 10 societies (A...J).

Table 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	X	0	0	0	0	0	0	0	0	0	0	0	0	0
B	X	0	0	X	0	0	0	0	X	X	0	0	0	0
C	X	X	0	X	0	0	0	0	X	X	0	0	0	0
D	X	X	X	X	0	0	0	0	X	X	X	X	0	X
E	X	X	X	X	0	X	X	X	X	X	X	X	X	X
F	X	X	X	X	0	0	X	X	X	X	X	X	X	X
G	X	X	X	X	0	0	X	0	X	X	X	X	0	X
H	X	0	0	0	0	0	0	0	X	0	0	0	0	0
I	X	X	0	X	0	0	0	0	X	X	0	X	0	0
J	X	X	X	X	0	0	0	0	X	X	X	X	0	0

No particular pattern is evident in this array. If, however, the table is rearranged so that the traits appear in order of decreasing frequency from left to right and the societies in increasing order from top to bottom according to number of traits present, the following results.¹

Table 2

	1	9	4	10	2	12	3	11	14	7	8	13	6	5
A	X	0	0	0	0	0	0	0	0	0	0	0	0	0
H	X	X	0	0	0	0	0	0	0	0	0	0	0	0
B	X	X	X	X	0	0	0	0	0	0	0	0	0	0
C	X	X	X	X	X	0	0	0	0	0	0	0	0	0
I	X	X	X	X	X	X	0	0	0	0	0	0	0	0
J	X	X	X	X	X	X	X	X	0	0	0	0	0	0
D	X	X	X	X	X	X	X	X	X	0	0	0	0	0
G	X	X	X	X	X	X	X	X	X	X	0	0	0	0
F	X	X	X	X	X	X	X	X	X	X	X	X	0	0
E	X	X	X	X	X	X	X	X	X	X	X	X	X	0

¹The rearrangement process is seldom this simple. Several attempts are frequently necessary, and with large amounts of data the procedure can be both tedious and cumbersome. A more detailed discussion of data handling can be found in sources by Edwards and Torgerson (see footnote previous page).

256

Here there is a definite pattern, in fact, a perfect scale. It is, of course, unimportant whether societies or traits are assigned to rows or columns, or whether order increases or decreases from left to right or top to bottom. What one is searching for are scale types in the trait patterns of societies. A scale type response pattern is one in which there are uninterrupted series of Xs and Os. Thus (X X X X X 0 0 0 0) would be a scale type response pattern while (X 0 X X X 0 0 0) would be a non-scale type response pattern, with one error. Thus in the example (Table 2) there is a perfect scale because the response pattern for each society is a scale type.

Such a scale has a number of formal properties, of which the following are most important for the analyst of development: 1) Societies with higher rank on the scale have all the traits of societies with lower rank, and some in addition. 2) Knowledge of the presence of one trait in a society indicates the presence of others as well. 3) Knowledge of the absence of any one trait in a society indicates the absence of others as well. 4) If the traits are numbered, and the number of the highest ranking trait for a particular society is known, the complete inventory of traits for that society can be identified. Thus, knowledge of the presence or absence of a single trait enables the analyst to make quite powerful inferences concerning the entire trait pattern of the society. Finally, if a series of traits can be shown to scale, then the analyst knows that the traits are unidimensional; he knows, that is, that there is one variable underlying all of the others.

Three questions immediately arise: How does one select the societies to be tested? How does one select the items or traits for such analysis? And how does one determine how much error (non-scale responses) may be tolerated?

257

In any cross-national study it is necessary, if the results are to have any meaning at all, to limit one's efforts to some well-defined universe of nations. One might use, for example, all autonomous nations which gained independence before a certain date (presuming that one had a conceptually sound reason for choosing that particular date). In this chapter, use has been made of either all the independent nations in a particular geo-cultural area, in keeping with the definition of patterns or families of developing nations, or all the independent nations of the world which are generally classified as underdeveloped. Normally the only reason for omitting a nation from a specified universe would be lack of data. If one is dealing with some social unit other than the nation, such as small villages, primitive cultures, urban areas, etc., one is likely to find it impossible to include in the study all the units in the universe. In such cases a fairly large number of cases should be used to ensure that chance has not influenced the results. Lacking this, one should aim for a representative sample (an easier task in theory than in practice). If representativeness cannot be achieved the biases in the sample should be fully noted.¹

Perhaps the most difficult single step in scalogram analysis, sometimes regarded as more nearly an "art" than a "science," is choosing the traits or items to test. In most general terms, one starts with a theory or hypothesis and selects items which ought, on the basis of that theory or hypothesis, to form a scale. Yet it appears that little in the way of advice can be given beyond this principle. Limited insight into this

¹These prescriptions are, of course, standard lore in cross-cultural methodology. For a particularly useful example of how the difficult problems presented by these prescriptions can be dealt with, see F. W. Young, Initiation Ceremonies, op. cit., pp. 42-50.

358

problem can be gained from examining scales developed by others, for in this manner one may slowly get a "feel" for the process. Unfortunately, researchers developing scales rarely identify the items which were tried and discarded, and even more rarely note bases for rejection. Frequently an item will not scale because a cross-culturally applicable definition cannot be devised or because data concerning it are not reported for any but a few societies.

For illustrative purposes a perfect scale has been presented; reality, however, is seldom so neat and orderly as to allow the discovery of a perfect scale. For one thing, the researcher can never be entirely sure that the definitions and coding rules used are adequate. Furthermore, the reporting of social data, particularly for the underdeveloped world, is notoriously haphazard -- and some societies simply do not fit the standard pattern. The question then arises: How much error is too much error? At what point does one say that a scale does not obtain for this data?

The conventional answer to the last question has been to use the Coefficient of Reproducibility as originally devised by Guttman. This is simply the number of "correct" or non-error responses as a proportion of the total responses. If the CR is above 0.90 it is generally agreed that a scale is present.¹ The Coefficient of Reproducibility can, however, give spuriously high results if there are many items which have high

¹There are several other criteria which must be met to assure that CR is not spuriously high: 1) For dichotomized responses, at least 10 items should be used; 2) Few if any items should have more than 80% of the responses in their modal category; 3) The pattern of errors should be random, that is there should not be a number of subjects with the same non-scale pattern of responses; 4) Each item should have more non-error than error.

259

marginal totals (more than 80 percent of the responses in their modal category). Since such items are frequently found in social object scaling, it is wise to use the Coefficient of Scalability, devised by Menzel,¹ which corrects for this difficulty. The formula for this coefficient, when dichotomous items are used, is:

$$\text{Coefficient of Scalability} = 1 - \frac{\text{Errors}}{\text{Smallest number of non-modals}}$$

To obtain the denominator (Smallest number of non-modals) one sums the non-modal responses over columns and over rows (in the above example these numbers would be 34 and 36 respectively) and uses the smaller of the two. The generally accepted minimum for this coefficient is 0.65. One of the most common criticisms of both of these error evaluation techniques is that the acceptable minimum levels are rather arbitrarily determined. What makes 0.30 or 0.65 "magic numbers"? Goodman² suggests a fairly simple statistical method for determining whether the observed error in a scale is significantly different from what could be expected were the responses to the several items independent. This approach, though it has as yet only rarely been used in social object scaling, has much to recommend it, since it provides a conceptual basis for concluding whether there is too much error in a given pattern for it to be considered a scale.

¹Menzel, op. cit.

²Goodman, op. cit., pp. 31-32.

260

A Scale of Institutional Educational Development

Social development, it has been suggested, involves the progressive differentiation of institutional structures along a series of single dimensions. (See Chapter 1) For the educational sector, development implies progressive and systematic differentiation and specialization for educational levels and institutions. Guttman scaling is a particularly suitable technique for testing the hypothesis that a highly developed educational system would have a more complex differentiated institutional structure than a less developed one.

The selection of variables in testing this hypothesis proved to be a difficult task. Since the items used were educational institutions, whose simple presence or absence was noted, it was possible to avoid some of the problems encountered in quantitative studies; but even such data as were needed were, for many of the poorer and newer nations, not to be found. Therefore, variables were chosen which not only satisfied the typological requirement that their presence should indicate more institutional development than their absence, but which also were subject to relatively standard definition and for which information was generally available. Eighteen variables were finally chosen which seemed to satisfy these requirements.

They are listed below:¹

¹This is not an exhaustive list of possible educational institutions. A number of others were considered, but discarded either because of inadequate data or because no cross-culturally applicable definition could be devised. These included: in-country text production; in-service teacher training; special training for secondary teachers; higher agricultural education; national educational research; P.T.A.s; pre-primary education; higher-level training of primary teachers; more public than private schools at each level; professional teacher's organizations; advanced degrees offered in various courses of study (using a variety of disciplines).

361

1. Ministry of education
2. Teacher training institution
3. Inspectorate
4. Curriculum agency
5. University
6. Examinations required for university admission
7. At least 40% of elementary students female
8. At least 25% of secondary students female
9. Vocational schools at the secondary level
10. Special education
11. Special education schools
12. Radio service to schools
13. Production of educational films by the ministry
14. Official education plan(s)
15. Educational plan(s) integrated with general development plan
16. Special training for educational planners
17. University faculties of Biology, Chemistry and Physics
18. University faculties of Sociology and/or Anthropology

The coding rules for these variables were these:

1. Ministry: existence within country of ministerial level body charged with general responsibility for education.
2. Teacher training institution: existence within country of any institution at either secondary or higher level which trains teachers for any level of education.
3. Inspectorate: existence within country of an indigenous corps of inspectors for any level of education.
4. Curriculum agency: existence within country of ministerial agency or group under ministry supervision charged with responsibility for preparing curricula.
5. University: existence within country of institution of higher learning called "university,": colleges, non-integrated faculties, or university colleges do not qualify.
6. Examinations required for university admission: entrance to the university(ies) as a full-time student in a degree program dependent upon an examination administered by the university(ies).
7. At least 40% of elementary students female: self-explanatory.
8. At least 25% of secondary students female: self-explanatory.
9. Vocational schools at the secondary level: existence of separate schools whose primary purpose is to qualify students for an occupation, rather than for further education, serving students of the same age as those attending general (university preparatory) secondary schools.

362

10. Special education: some provision for separate education of physically or mentally handicapped.
11. Special education schools: existence of more than one separate institution providing special education for physically or mentally handicapped.
12. Radio service to schools: regular broadcasts designed for, and used in, classroom work at any level of education, provided by any private or public broadcasting concern.
13. Production of educational films by the ministry: production and distribution, on a regularized basis, of films (motion pictures -- not filmstrips) intended for classroom use, by the ministry charged with the responsibility for education.
14. Official education plan(s): existence of a formal document called a "plan" for any level or sector of the educational system.
15. Educational plan(s) integrated with general development plan:
1) education plan as a section of general plan; or 2) separate educational plan(s) prepared in conjunction with general plan.
16. Special training for educational planners: provision either within or outside of country for specialized training of those responsible for preparing educational plans.
17. University faculties of Biology, Chemistry and Physics: existence of separate faculties or departments for all three sciences.
18. University faculties of Sociology or Anthropology: existence of separate faculties or departments of either discipline.

For theoretical reasons previously described and because of an area bias in this study, an attempt was first made to construct a Guttman scale using 19 Latin American countries, for which a great deal of data was readily available. Six of the original 18 items failed to differentiate between these 19 countries, being present in all. Considering that Latin America is a relatively homogenous cultural unit, and is, as an area, more highly developed educationally than any other developing region, this was not surprising. The remaining items formed a scale. (Scale #1)

263

Scale #1

	University, Etc.	At least 40% elementary students female	Vocational schools at secondary level	Special education	Official education plan	Special education schools	Special training for educational planners	University faculties of Biology, Chemistry & Physics	Integrated educational plans	Radio service to schools	Production by ministry of education films	University faculties of Sociology & Anthropology	Examinations for university admission
Haiti	X	O	O	O	O	O	O	O	O	O	O	O	O
Guatemala	X	X	X	O	O	O	O	O	O	O	O	O	O
Dominican Republic	X	X	X	O	O	O	O	O	O	O	O	O	O
Nicaragua	X	X	X	X	O	O	O	O	O	O	O	O	O
Uruguay	X	X	X	X	O	X	O	O	O	X	O	O	O
Venezuela	X	X	X	O	X	O	O	O	X	X	O	O	O
El Salvador	X	X	X	X	X	O	O	O	O	O	O	O	O
Honduras	X	X	X	X	X	O	X	O	O	O	O	O	O
Bolivia	X	X	X	X	X	O	O	O	X	O	O	O	X
Costa Rica	X	X	X	X	X	O	O	X	O	O	O	O	O
Peru	X	X	X	X	X	X	O	O	O	O	O	O	O
Paraguay	X	X	X	X	X	X	X	X	O	O	O	O	O
Ecuador	X	X	X	X	X	X	X	X	X	O	O	O	O
Panama	X	X	X	X	X	X	X	O	X	X	O	O	O
Mexico	X	X	X	X	X	X	X	X	O	X	X	X	O
Colombia	X	X	X	X	X	X	X	X	X	X	X	X	X
Argentina	X	X	X	X	X	X	X	X	X	X	X	X	X
Chile	X	X	X	X	X	X	X	X	X	X	X	X	X
Brazil	X	X	X	X	X	X	X	X	X	O	X	X	X

Scale #1

Scale of Institutional Educational Development -- Latin America

<u>Step #</u>	<u>Item Content</u>	<u>Prop. of countries having item</u>	<u>Error</u>
1.*	University Teacher training institution Ministry of education Inspectorate Curriculum agency At least 25% secondary students female	1.00	--
2.	At least 40% elementary students female	.95	0
3.	Vocational schools at secondary level	.95	0
4.	Special education	.79	1
5.	Official education plans	.74	0
6.	Special education schools	.53	1
7.	Special training for educational planners	.47	1
8.	University faculties of Biology, Chemistry, and Physics	.42	2
9.	Education plan integrated with general development plan	.42	3
10.	Radio service to schools	.37	3
11.	Production of educational films by ministry	.26	0
12.	University faculties of Sociology or Anthropology	.26	0
13.	Examinations required for university admission	.26	1

*The first six items, in Step #1, are not properly part of the scale, as they are present in all 19 countries, but are included to give a complete picture. The coefficients of reproducibility and scalability were computed using steps 2-13.

365

Since perfect scalability was not achieved, three error evaluation techniques were used. The coefficient of reproducibility was found to be 0.95 and the coefficient of scalability 0.80. Both thus fall well above the accepted minimum levels. Using Goodman's technique, this scale was found to have significantly few (significant at 0.0001 level) errors.

Given these results the scale was extended to include the rest of the underdeveloped world. A 77 nation, ten-item scale was formed.¹ (Scale #2)

¹This list constitutes the entire universe with the exception of a few countries which were excluded either because their status as truly independent entities was uncertain or because no adequate data could be found. The following are not included: Bhutan, Burundi, Cuba, Jamaica, Mongolian People's Republic, North Korea, North Vietnam, Rwanda, Trinidad and Tobago, and Western Samoa.

Scale #2

	Ministry	Teacher training	Inspectorate	Curriculum agency	University	At least 25% secondary students female	Special education	Special education schools	University faculties of Biology, Chemistry & Physics	University faculties of Sociology or Anthropology	Production by ministry of education films
Muscat and Oman	0	0	0	0	0	0	0	0	0	0	0
Yemen	X	0	0	0	0	0	0	0	0	0	0
Congo, Brazzaville	X	X	*	*	0	0	0	0	0	0	0
Ivory Coast	X	X	*	*	0	0	0	0	0	0	0
Niger	X	X	*	*	0	0	0	0	0	0	0
Togo	X	X	0	0	0	0	0	0	0	0	0
Gabon	X	X	X	*	0	0	0	0	0	0	0
Chad	X	X	X	0	0	0	0	0	0	0	0
Cameroon	X	X	0	X	0	0	X	0	0	0	0
Mauritania	X	0	X	X	0	0	0	0	0	0	0
Central Afr. Rep.	X	X	X	X	0	0	0	0	0	0	0
Tanzania	X	X	X	X	0	0	0	0	0	0	0
Guinea	X	X	X	X	0	0	0	0	0	0	0
Mali	X	X	X	X	0	0	0	0	0	0	0
Somali Republic	X	X	X	X	0	0	0	0	0	0	0
Laos	X	X	X	X	0	0	0	0	0	0	0
Kuwait	X	X	X	X	0	0	X	0	0	0	0
Jordan	X	X	X	X	0	0	X	0	0	0	0
Senegal	X	X	*	*	X	0	0	0	0	0	0
Nepal	X	X	X	X	X	*	*	*	0	0	0

367-

Scale #2 (continued)

	Ministry	Teacher training	Inspectorate	Curriculum agency	University	At least 25% secondary students female	Special education	Special education schools	University faculties of Biology, Chemistry & Physics	University faculties of Sociology or Anthropology	Production by ministry of education films
Congo, Leopoldville	X	X	X	X	X	0	0	0	0	0	0
Cambodia	X	X	X	X	X	0	0	0	0	0	0
Nigeria	X	X	X	X	X	0	0	0	0	0	0
Libya	X	X	X	X	X	0	0	0	0	0	0
Sudan	X	X	X	X	X	0	0	0	0	0	0
Afghanistan	X	X	X	X	X	0	0	0	0	0	0
Ghana	X	X	X	X	X	0	0	0	0	0	0
Iraq	X	X	X	X	X	0	0	0	0	0	0
Saudi Arabia	X	X	X	X	X	0	0	0	0	0	0
Malawi	X	X	X	X	X	0	0	0	0	0	0
Upper Volta	X	X	X	*	0	X	0	0	0	0	0
Dahomey	X	X	X	X	0	X	0	0	0	0	0
Uganda	X	X	X	X	0	X	0	0	0	0	0
Ceylon	X	X	X	X	X	X	0	0	0	0	0
Haiti	X	X	X	X	X	X	0	0	0	0	0
Guatemala	X	X	X	X	X	X	0	0	0	0	0
Dominican Republic	X	X	X	X	X	X	0	0	0	0	0
Tunisia	X	X	X	X	X	X	0	0	0	0	0
Iran	X	X	X	X	X	X	0	0	0	0	0
Venezuela	X	X	X	X	X	X	0	0	0	0	0

2368

Scale #2 (continued)

	Ministry	Teacher training	Inspectorate	Curriculum agency	University	At least 25% secondary students female	Special education	Special education schools	University faculties of Biology, Chemistry & Physics	University faculties of Sociology or Anthropology	Production by ministry of education films
Burma	X	X	X	X	X	X	O	O	O	O	O
Lebanon	X	X	X	X	X	X	O	O	O	O	O
Malagasy Republic	X	X	X	X	X	X	O	O	O	O	O
Morocco	X	X	X	X	X	X	O	O	O	O	O
Algeria	X	X	*	*	X	X	X	O	O	O	O
China (mainland)	X	X	X	X	X	X	X	*	*	*	O
Kenya	X	X	X	X	O	X	X	O	O	O	O
Cyprus	X	X	X	X	O	X	X	O	O	O	O
Nicaragua	X	X	X	X	X	X	X	O	O	O	O
El Salvador	X	X	X	X	X	X	X	O	O	O	O
Philippines	X	X	X	X	X	X	X	O	O	O	O
Bolivia	X	X	X	X	X	X	X	O	O	O	O
Honduras	X	X	X	X	X	X	X	O	O	O	O
Thailand	X	X	X	X	X	X	X	O	O	O	X
Costa Rica	X	X	X	X	X	X	X	O	X	O	O
Sierra Leone	X	X	X	X	X	X	X	O	X	O	O
Liberia	X	X	X	X	X	O	X	X	O	O	O
UAR	X	X	X	X	X	O	X	X	O	O	O
Korea, Republic of	X	X	X	X	X	O	X	X	O	O	O
Ethiopia	X	X	X	X	X	O	X	X	O	O	O

Scale #2 (continued)

	Ministry	Teacher training	Inspectorate	Curriculum agency	University	At least 25% secondary students female	Special education	Special education schools	University faculties of Biology, Chemistry & Physics	University faculties of Sociology or Anthropology	Production by ministry of education films
Uruguay	X	X	X	X	X	X	X	X	O	O	O
Peru	X	X	X	X	X	X	X	X	O	O	O
Vietnam, South	X	X	X	X	X	X	X	X	O	O	O
Malaysia	X	X	X	X	X	X	X	X	O	O	O
Panama	X	X	X	X	X	X	X	X	O	O	O
Pakistan	X	X	X	X	X	O	X	X	X	O	O
Indonesia	X	X	X	X	X	O	X	X	X	O	O
Paraguay	X	X	X	X	X	X	X	X	X	O	O
Ecuador	X	X	X	X	X	X	X	X	X	O	O
China (Taiwan)	X	X	X	X	X	X	O	O	X	X	X
India	X	X	X	X	X	O	X	X	X	X	O
Israel	X	X	X	X	X	X	X	X	X	X	X
Mexico	X	X	X	X	X	X	X	X	X	X	X
Colombia	X	X	X	X	X	X	X	X	X	X	X
Argentina	X	X	X	X	X	X	X	X	X	X	X
Chile	X	X	X	X	X	X	X	X	X	X	X
Brazil	X	X	X	X	X	X	X	X	X	X	X

*No data

Scale #2

Scale of Institutional Educational Development -- 77 nations

<u>Step #</u>	<u>Item Content</u>	<u>Prop. of countries having item</u>	<u>Error</u>
1.	Ministry of education	.99	0
2.	Teacher training institutions	.96	1
3.	Inspectorate	.95	1
4.	Curriculum agency	.94	0
5.	University	.71	5
6.	At least 25% secondary students female	.53	7
7.	Special education	.44	4
8.	Special education schools	.26	1
9.	University faculties of Biology, Chemistry, and Physics	.15	2
10.	University faculties of Sociology or Anthropology	.10	0
11.	Production of educational films by ministry	.10	2

Once again the coefficients of reproducibility and scalability were computed and found to be well above the acceptable minimums (0.97 and 0.86 respectively) and there were found to be significantly few (significant at the .0000001 level) errors using Goodman's evaluation technique. Some comments are in order concerning the items in this scale. All of the items which did not differentiate among the Latin American nations could be included when nations substantially less developed were added. One item, "At least 40 percent of elementary students female," did not fit the large scale. As items defined by arbitrary cutting points frequently do not scale due to the very arbitrariness of the cutting points, this was neither surprising nor alarming, and was not considered a major problem. It simply indicated that this particular cutting point was not useful outside Latin America. The three variables related to educational planning, included in the Latin American scale but not in the world-wide scale, deserve special note. Information as to the nature and extent of educational planning was difficult to find beyond the boundaries of the relatively well-reported Latin American area; and where such information was available it was impossible to arrive at a satisfactory definition of any of the three items, due to differences in terminology. A preliminary scale, including 55 countries, was constructed which included two of these items, but they were found to be subject to a great deal of error. This probably results from definitional problems, as well as from the great emphasis which has recently been placed upon planning by international or other fund supplying agencies. Many countries which are patently unable to reach the goals specified in their plans, due to the lack of the necessary supporting institutions, have nevertheless produced documents which are, in name at least, educational plans. The planning items were therefore eliminated.

Adequate and reliable data were not available for a sufficiently large number of nations to warrant inclusion of the remaining two items from the Latin American scale: "Examinations required for university admission," and "Radio service to schools," in the world-wide scale.

These scales provide a great deal of information valuable both to the educational planner and to the student of national development. One of the problems which plagues students of development, and analysts of social processes generally, is the difficulty of devising measures which are "pure," in the sense that they do not reflect several variables at the same time. Enrollment ratios, for example, are not "pure" measures because the factors which can influence their size include such things as: relative size of the school-age population (a nation with a relatively small proportion of its population of school-age is likely to have an easier time achieving a high enrollment ratio than a nation with a large proportion in this age group); amount of government investment in education, both currently and over a period of time (and this latter might indirectly reflect the length of time a nation has been independent and the policies of the particular colonial power which previously controlled it); the presence or absence of war, in that a nation devastated by intra- or inter-national conflict will likely have fewer children in school; and so on. Further, it is difficult to determine just which factors are operating in a given situation. When country X reports a higher primary enrollment than country Y, what measurement does this allow: current government effort, past government effort, demographic characteristics, etc.? It simply can't be determined, for this is a measure without a clear referent.

Scalogram analysis, as mentioned earlier, demonstrates unidimensionality; it indicates that the items on the scale together measure a single

612

variable. Further, the hypothesis indicates exactly what that variable is: in this case, institutional differentiation and specialization of the educational system. In the language of formal measurement theory, the construction of a societal rank typology involves the assumption of both systematic differences among societies on a number of variables and systematic variation among the variables themselves. Scalogram analysis, demonstrating unidimensionality, indicates that such systematic variation is present, and thus provides a typology with a single empirical referent.¹ In other words, it is possible to know precisely what is being measured. If, for example, Chile ranks higher on the scale than Ecuador, this means simply that the Chilean educational system is institutionally more differentiated and specialized than that of Ecuador. Further, the respects in which they differ can be precisely identified. If Chile has a score of 13 (score being determined by the scale step of the highest ranking non-error institution in a society) and Ecuador a score of 9, it is evident just which four institutions account for the difference.


The concept of unidimensionality, which has been central to the analysis above, has sometimes been criticized on the grounds that it is only one of many possible explanations for the existence of a scale pattern, and that accepting the notion of unidimensionality in advance tends to close off theoretical speculations concerning the scale pattern. Since unidimensionality has played an important part in the argument in the preceding few paragraphs, it will be useful to examine this criticism.

¹Robert Winch and Linton Freeman, "Societal Complexity: An Empirical Test of a Typology of Societies," American Journal of Sociology, 62 (5), March, 1957, p. 462.

574

An initial point needs to be made. Even without the concept of unidimensionality these scales would be at least as useful for ranking purposes as the more common measurement techniques. Measurement of social class, as typically done, is a good example. It is possible to have quite a clear concept of social class and yet be unable to find indicators that represent only social class, and do not reflect such variables as rurality, age, intelligence, personal taste, etc. The usual procedure therefore is to start out with a pool of items which appear to reflect social class, and run intercorrelations among them. The items relating least to total score or some outside criterion are eliminated. Individuals being grouped by social class are then ranked according to how many of the remaining items they possess. Even if scale score is regarded as a simple count of the institutions possessed by a nation, it is at least as good a measure as that which is obtained by this procedure; indeed better, for without assuming unidimensionality it can be determined, with very little chance for error, just what items or institutions are represented by a particular score. Assuming unidimensionality, then, simply provides the added assurance that what is being measured is what was intended to be measured.

One can well argue, however, that accepting the concept of unidimensionality does not in the least shut off theoretical enquiry concerning the pattern evident in a scale. Having concluded that a single concept is being measured one can then proceed to ask why these particular items fall into this particular pattern. Note, for instance, that on the world-wide scale, the first four items, "Ministry of education," "Teacher training institution," "Inspectorate," and "Curriculum agency," seem to form a group, being present in all but 18 of the 77 nations. One possible explanation of this phenomenon is that these items are all relatively



"cheap" institutions; it requires neither a great deal of money nor effort to have them. Three of these, ministry, inspectorate, and curriculum agency, also may well be used for political patronage. One would then expect a substantial drop in the scale at the first relatively "expensive" items, "University," and "At least 25% of secondary students female," and there is. One might further ask why the university is the first of these expensive items to occur. Several explanations are possible. Universities, or separate faculties or university colleges which are easily converted into universities, were sometimes instituted by colonial governments. In addition, universities have become something of an international prestige symbol, and are often seen as essential to the development of high-level manpower which has been so much emphasized in recent literature on national planning.

Certain other questions are raised by the world-wide scale: Why does special education, an item which could easily be considered a luxury in relation to national development, occupy so high a position on both of these scales? Do those institutions which are lower on the scale in any sense form bases or a sort of "infrastructure" for those items which are higher? These questions and tentative explanations are meant, of course, only to illustrate a general point: that the assumption of unidimensionality does not shut off further theoretical enquiry; that scalogram analysis, with or without this assumption, leads one to ask questions and explore relationships, both theoretical and practical, which might otherwise be ignored.

In addition, scalogram analysis makes it possible to predict which societies are most likely to acquire a new institution. It traces what might be called the normal course of development for a society; that is, it indicates which institutions are likely to occur before or after others.

276

Historical continuity is not necessarily implied by the patterns of institutions in a scale, however, for it is quite possible for a society to acquire a number simultaneously, or to acquire an advanced trait and then "backfill" to get the ones which were skipped. One might expect a nation like Venezuela, for example, referring to the Latin American scale, to acquire within the next few years the institutions which are missing in its scale pattern: special education, special education schools, special training of educational planners, and university science faculties. In studies pertinent to this point Olaf Larson and Ruth Young have provided scales of village-level differentiation in Italy constructed for two periods ten years apart. On the second scale half of what had been errors (items missing where they should have existed) on the first scale had been made up -- a large proportion to be accounted for by chance.

Having some knowledge about how institutional systems tend to develop allows one to ask more penetrating questions about the deviations. Why, for instance, is Bolivia the only Latin American nation which has examinations for university admissions and none of the preceding items? Or why, on the world-wide scale, is Thailand the only country which has production by the ministry of educational films with none of the preceding items?

Further consideration of the utility of scalogram analysis requires consideration of the relation of a scale to time. It is erroneous to conceive of development as an evolutionary sequence, and to interpret the scales as indicating a sequence through which each nation must inevitably pass. The scales are time-bound. They indicate 1) the relative strength of the various nations with respect to institutional differentiation and specialization of the educational system at a given point in time; and 2) they provide an idea of the educational structure in terms of what appear

to be more or less common or basic traits, indicating which ones are easier to acquire, simpler, perhaps even functionally necessary in order for succeeding traits to become established.

But technical and human changes take place. Items will likely change their scale position over a period of time. In a scale of U.S. community institutions a blacksmith shop would have been a common item in 1890, whereas it would be almost non-existent today. A gas station today in contrast with 1920 would be a common item on such a scale, that is, it would be much higher up the scale relative to such other items as doctors, grocery stores and so forth.

Although the relative position of scale items can change quite substantially over time, the relative position of nations may change very little. To make this clearer, suppose a new universal language is invented and begins to spread in national educational systems. At present no university has a department of "polyglot." But the new language might be much easier to learn, demand less specialization on the part of teachers, and require less money and equipment on the part of universities than either science or sociology. Further, to many people mastery of this language might seem much more important for social development. Hence while a university department of "polyglot" is not on the education scale at all now, in a few years it might rank well ahead of either departments of science or sociology, and 70 percent of the nations on the scale might have advanced departments of "polyglot" while comparatively few would have departments of science or sociology. If a nation starts to develop its educational system today, a university department of "polyglot" is not an important part of the sequence of development. Ten years hence it might be.

Lest the point become obscure, a scale does show the relative importance or generality of educational institutions, but the general educational structure is in a state of constant, if slow, change. Scales, then, picture the present; next year "things" may be a little different; twenty years from now they may be quite different. Nevertheless, scales can offer a reasonable approximation of what a nation with a developed educational system has now, had a few years ago, will have a few years hence.

It is possible to predict quite well, then, the relative ranking of nations over a period of time and the approximate structure of a nation of a given rank within a period of years. What cannot be predicted are innovations, that is, items that are not now in existence. Prediction of when they will enter or how far through the set of nations they will travel cannot be made from knowledge intrinsic to the scale. Nor can changes in other societal institutions which might affect scale items be predicted.

Summarizing, then, scales can give a particular nation guidance as to possible and efficient next steps. They can give technical assistance agencies guidance concerning which nations can most profitably receive new institutions first, and the approximate order in which nations can be expected to effectively utilize new institutions. Scales are good approximations of the present social order and are good models against which to question deviations, adjustments, and changes.

It has been demonstrated that the institutional development of an educational system is part of a scalable universe, and that it is possible to develop a typology which will permit the ranking of societies on this dimension of educational development. The practical utility of these scales for planning purposes will be much improved as further work is done,

adding items to the scales, attempting to redefine items which were eliminated due to definitional difficulties, attempting to construct scales for these same countries at different points in time, and so forth.

To illustrate further the analytic utility of scalogram analysis the correlations have been computed using the Kendall Tau coefficient between the rankings of the countries on this scale with their rankings on other measures of social and economic development. The greater share of this work was done using the Latin American scale because of the availability of the rankings of these countries on 97 social indicators. A few series from other sources were used, particularly for testing the Near Eastern nations and the total list of countries on the world-wide scale.

Table 3

Correlations between rankings of Latin American Countries on Institutional Educational Development Scale and their rankings on other measures of social and economic development.¹

Kendall Tau used * = sig. at .05 level; ** = sig. at .01 level

INDUSTRIAL URBANIZATION SERIES

+.49**	No. of telephones per 1000 population
+.49**	No. of patents filed by country with U.S. Patent Office
+.51**	% of total population in manufacturing
-.50**	% of total population in primary production
+.53**	Average rate of urbanization
+.54**	% of total population living in centers of 2500 or more
+.37*	% of total population living in centers of 100,000 or more
+.35*	Electricity generated -- kilowatt hrs. per cap.
+.42*	% of total population in service industries
-.52**	% of population 15 yrs. or over illiterate
-.15	Growth rate Gross Domestic Product
+.39*	Combined index of socio-economic development ²
+.38*	% of active population in urban middle class ³
.18	Gross national product per capita in \$U.S. (1957) ⁴

POLITICAL SERIES

+.86**	Almond index of political competitiveness
-.33	Cutwright index of political development
+.02	% voting in last general election

WELFARE SERIES

+.48**	No. of calories per day consumed per capita
+.45**	No. of grams protein consumed per day per capita
+.18	No. of hospital beds per 1000 population

COMMUNICATION SERIES

+.07	International mail flow
+.30	Newspaper circulation per 1000 population
+.32	Radio receivers per 1000 population
+.52**	No. of radio transmitters

TRANSPORTATION SERIES

+.27	No. of motor vehicles per 1000 population
+.14	Railway density: kilometers per person rel. to pop. distance ⁴

EDUCATION SERIES

+.25	Combined primary, secondary, higher educ. enrollment ratio ⁵
+.36*	Primary enrollment ratio (ages 5-14)
+.27	Secondary enrollment ratio
+.26	No. in higher educ. per 100,000 persons in total pop.
+.27.	Government expenditure on education per cap.
+.19	% of higher educ. students in natural sciences ⁶
+.13	% of primary teachers without certificates ⁶
+.47**	% of universities in rel. to no. of primary schools ⁶
+.37*	% of total population in post-primary educ. ⁴
+.34*	Total population
+.44**	Secondary enrollment ratio, 1965 (projected in 1963) ⁷
+.37*	Secondary enrollment ratio, 1970 (projected in 1963) ⁷
+.37*	Higher educ. enrollment ratio, 1965 (projected in 1963) ⁷
+.39*	Higher educ. enrollment ratio, 1970 (projected in 1963) ⁷

¹All data from Ruth Young (unpublished data) except as noted.

²Perspectivas de Desarrollo de la Educacion en 19 Paises Latino-americanas, Washington, D.C., Union Panamericana, 1963.

³B. F. Hozelitz and W. E. Moore, Industrialization and Society, New York, UNESCO, 1963.

⁴Norton Ginsburg, Atlas of Economic Development, Chicago, University of Chicago Press, 1961.

⁵La Educacion Superior en America Latina, Washington, D.C., Union Panamericana, 1963.

⁶Perspectivas. . . .(Anexos)

⁷O. J. Bardeci and F. Escondrillas, Financiamiento de la Educacion en America Latina, Washington, D.C., Union Panamericana, 1963, p. 36.

781

Table 4

Correlations between rankings of Near Eastern countries on Institutional Educational Development Scale and their rankings on other measures of social development.¹

Kendall Tau used * = sig. at .05 level; ** = sig. at .01 level

+ .52*	Gross National Product per cap.
+ .36	% of total pop. in centers of 20,000 or more
+ .59**	% of adults literate
+ .59**	No. of calories consumed per day per cap.
+ .55**	International mail flow
+ .71**	Daily newspaper circulation per 1000 population
+ .54*	Railway density: Kilometers per person rel. to pop. distance
+ .54*	% of total pop. in post-primary education

Correlations between rankings on scale and other measures of social development for all countries.

+ .40**	Electricity generated: kilowatt hrs. per cap.
+ .60**	Almond index of political competitiveness
+ .47**	% of total pop. in post-primary education

¹All data series used taken from Ginsburg, Atlas of Economic Development.

732

Some comments concerning the interpretation of the Kendall Tau statistic may be helpful before considering some of the relationships shown in Tables 3 and 4, since it is interpreted rather differently from the more commonly used correlation coefficients. A Tau of .62, for example, may be interpreted as follows: "If a pair of objects is drawn at random from among those ranked, the probability that these two objects will show the same relative order in both rankings is .62 more than the probability that they would show different order. In other words from the evidence at hand it is a considerably better bet that the . . . randomly selected pair (will be ordered) in the same way than in a different way."¹ Experience has shown that with the same data, a Tau coefficient will be lower than the more commonly used Spearman rank order coefficient.

Earlier it was pointed out that levels of significance, when attached to cross-national statistical computations, should be viewed with caution. Nevertheless the correlations which are significant at the .01 and .05 levels have been indicated. Although such levels are of dubious utility in demonstrating conclusively that a particular relationship is significant, they can be useful in a negative way, as Russett points out, in weeding out relationships which are misleading because based on a small number of cases, a weak coefficient, or both.² Beyond this, there is more concern with identifying patterns than with individual correlations. Thus the fact that the scale relates strongly to any particular indicator is of less interest than if it relates strongly to a number of similar indicators.

¹William L. Hays, Statistics for Psychologists, New York, Holt, Rinehart and Winston, 1963, p. 649.

²Russett, et al., Handbook of Political and Social Indicators, p. 263.

282

A number of interesting patterns are evident in the Latin American correlations. The correlations with all but two of the indicators of industrialization and urbanization are significant, and the two measures with which there are non-significant correlations, GNP per capita in \$ U.S., and Growth Rate of GNP, are rather inadequate indicators for at least these reasons: 1) they are subject to equivocal measurement; and 2) they do not necessarily consider the subsistence sector of the economy. Parenthetically, one researcher has found that all of these measures, excluding the last four, are very highly intercorrelated, seeming to measure industrial urbanization rather than urbanization per se.¹ In this connection it is notable that one of the weakest significant correlations in this group is that between the scale and the one large-scale urbanization measure, percent of total population living in centers of 100,000 or more. The Latin American scale, then, is apparently measuring an aspect of educational development which is closely related to the process of industrialization. There are at least two possible explanations. One possibility is that there is a unidirectional causal relationship between the two; that structural educational development is in some sense a necessary prerequisite for industrial development. The second possibility is that there is interacting causality between the two; that structural educational development contributes to industrial development, and vice versa. Thus the development of a ramified and specialized industrial structure, with its bureaucracy, technical specialists, and so forth, is reflected in the parallel development of a more ramified and specialized educational structure, with an expansion of the ministerial bureaucracy and the creation of a variety of educational

¹Ruth Young, unpublished data.


specialists, such as is evident in the scale items. Perhaps the only way to conclusively test these possibilities would be through time-lag analysis, but examination of the scale appears to support the latter. Not only do the scale items seem to constitute an "industrial-type" structure in educational institutions, but many of them are concerned with the production of middle or higher level manpower, one requisite of industrial development.

An assumption of this sort is particularly interesting in light of another major pattern evident among these correlations: the almost complete lack of relationship between the Latin American scale and those education series which are concurrent with the scale (all but the last four -- the scale covers the period 1957-1961).

The one highly significant correlation in this group, that with percent of universities in relation to number of primary schools, appears to provide an internal validity check of the scale itself, since this indicator measures the institutional ramification of an educational system. The correlations with primary enrollment ratio and the Ginsburg measure of percent of total population in post-primary education are just barely significant. The scale, then, seems to be measuring a dimension of educational development which is quite different from whatever it is that these standard output indicators measure.

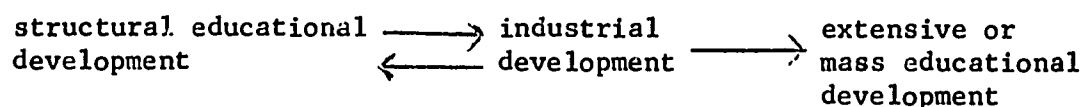
This finding opens up a number of fascinating avenues of inquiry. The existence of two (at least) quite distinct types of educational development might be hypothesized: one which involves extensive or mass production, and is reflected in enrollment and literacy figures; and another which involves a more intensive, technical and, at the higher levels, more specialized production. Both are related to industrial urbanization,¹

¹A number of studies have shown a correlation between mass output and economic development -- this relationship has become almost folklore in the study of national development.



although recent evidence indicates that mass output appears to be more a result than a cause of industrial development.¹ These different types of educational development involve different policy decisions, with perhaps quite different implications for general development. It is fairly obvious, of course, that different educational policies will have different implications for development. The important point is that educational policy choices may involve not merely the selection of one or another alternative strategy, but rather the selection of one or another entirely different type of educational development.

In this respect it should be noted that scale position correlates more strongly with projected than with then-current enrollment, at both the secondary and higher levels. A resulting tentative conclusion is that the institutional differentiation measured by the scale is functional (perhaps a necessary prerequisite) to future enrollment increases. In light of the evidence mentioned above concerning the relationship between enrollment increases and industrial development, it could be hypothesized that the two types of educational development and industrial development are related in somewhat the following fashion (arrows representing direction of causality):



¹cf. C. Arnold Anderson, "Economic Development and Post-primary Education," in Don C. Piper and Taylor Cole, Post-primary Education and Political and Economic Development, Durham, N.C.: Duke University Press, 1964. Anderson notes that, on a world-wide basis, 1938 income predicts 1955 primary enrollments more closely than 1930 enrollments predict 1955 incomes. "Excluding those countries with virtually complete literacy, we find that these coefficients are .57 and .20 respectively (using r^2). Moreover, the correlation of 1938 with 1955 incomes is .75 and the addition of 1930 primary enrollments raises it to only .77." (p. 4) Except for those few countries which export vast quantities of a very expensive mineral (e.g. oil) national income gives a fair approximation of industrial urbanization.

196

If this is an accurate picture, one would expect the two types of educational development to be related to industrial development, but would not expect them to be related strongly at any given point in time to each other; and one would expect scale position to relate more strongly to future enrollment increases. These are precisely the results found in the correlation analysis.

Of course these findings may indicate nothing more than the validity of the earlier argument that Guttman scaling provides a better measure of educational development than do enrollment ratios. That is, the results obtained when using the better measure would be expected to be rather different from those obtained when using inferior measures. But the notion that there are different types of educational development, related differently to general development, is certainly well worth exploring.

A further comment needs to be made concerning the apparent contradiction between the Ginsburg index (percent of total population in post-primary education), which was significantly correlated with the Latin American scale (though just barely), and the separate secondary and higher education ratios, which were not significantly correlated with the scale. The Ginsburg indicator was used for the Latin American countries, for which relatively good enrollment figures were available, in order to check its accuracy, since it was the measure of educational output used for the non-Latin American countries. The fact that the Ginsburg indicator produces different results than do the separate, and more reliable, measures of secondary and higher education output, seems to demonstrate that it is a relatively weak indicator.

Within the communication series the only strong correlation found was with number of radio transmitters. Young's work indicates that number of transmitters is not related to the other three communication measures,

387

but is related to measures of industrialization. This lends further support to the notion that the scale measures an aspect of educational development which is part of the industrialization process.

Moving to Table 4, it is clear that the high relationship between the scale and measures of industrialization holds, but that the absence of relationship between the scale and educational output, measured by the Ginsburg indicator, is not evident. This difference in relationship between the scale and educational output observed when the analysis is extended beyond Latin America may well be a reflection of the relatively greater accuracy of reporting in the Latin American area, the different indicators of output used, and the weakness of the Ginsburg indicator.

Additional comments and observations could be made concerning these correlations, but the above should be sufficient to illustrate the point that scales, even when not elaborated sufficiently to be of optimal utility to the practical task of the planner, can be quite useful for purposes of research, analysis, and theory-building.

Several other scales have been devised in the course of this study, and a consideration of one of these will further demonstrate the utility and general applicability of scalogram analysis.

Noting that the three items related to educational planning were part of the Latin American educational scale, the question arose as to whether national planning systems themselves constituted a scalable universe. That is, it was hypothesized that the development of national planning structures would involve the progressive and systematic differentiation and specialization of planning institutions. Based on available data¹ an 11-item scale was constructed (Scale 3) which has acceptably high coefficients of scalability and reproducibility and has significantly few errors using Goodman's test.

¹UNECLA, Economic Bulletin for Latin America, VIII (2), October, 1963, pp. 129-146.

-228

Scale #3

Scale of Latin American
Planning Structure

	Central planning office	Periodic production of national account figures	Official education plans	General 2-3 year development plans	Special training for educational planners	Integrated educational plans	General development plan (medium-long term)	Land reform	Program budgeting by autonomous agencies or sub-national govts.	Program budgeting by public enterprises	Structural reform of administration
Haiti	X	0	0	0	0	0	0	0	0	0	0
Dominican Republic	X	0	0	0	0	0	0	0	0	0	0
Nicaragua	X	0	0	0	0	0	0	0	0	0	0
Uruguay	X	0	0	0	0	0	0	0	0	0	0
Paraguay	X	0	X	0	0	0	0	0	0	0	0
Guatemala	X	X	0	0	0	0	0	0	0	0	0
El Salvador	X	X	X	0	0	0	0	0	0	0	0
Peru	X	X	X	0	0	0	0	0	0	0	0
Costa Rica	X	X	X	0	0	0	0	X	0	0	0
Honduras	X	X	X	0	X	0	0	X	X	0	0
Panama	X	X	X	X	X	0	0	0	0	0	0
Argentina	X	X	X	0	X	X	0	0	0	0	0
Brazil	X	X	X	X	X	X	0	0	0	0	0
Ecuador	X	X	X	X	X	X	X	0	0	0	0
Venezuela	X	X	X	X	0	X	X	X	0	0	0
Chile	X	X	X	X	X	X	X	X	0	0	0
Mexico	X	X	X	X	X	0	X	X	0	0	0
Bolivia	X	X	X	X	0	X	X	X	X	X	0
Colombia	X	X	X	X	X	X	X	X	X	X	X

Scale #3

Scale of Latin American Planning Structure

<u>Step #</u>	<u>Item</u>	<u>Marginals</u>	<u>Errors</u>
1.	Central Planning Office	1.00	--
2.	Periodic Production of National Account Figures	.74	0
3.	Official Educational Plan(s)	.74	1
4.	General 2-3 Year Development Plan	.42	1
5.	Special Training for Educational Planners	.42	3
6.	Education Plan Integrated with General Development Plan	.37	1
7.	General Development Plan (Medium or Long Term)	.31	0
8.	Adoption of Legislation Affecting Basic Land Reform	.37	2
9.	Program Budgeting by Autonomous Agencies or Regional or Municipal Governments	.16	1
10.	Program Budgeting by Public Enterprises	.10	0
11.	Adoption of Legislation Affecting Basic Structural Reform of Administration	.05	0

Coefficient of Reproducibility - .95

Coefficient of Scalability - .81

Coding rules for the educational planning items are listed earlier in this chapter and those for the remainder of the items can be found in the document from which the data was taken.

Examination of this scale leads to the same type of questions as were asked about the education scales. Why, for instance, is Honduras so subject to error, accounting alone for 30 percent of all the error in this scale? Are these items merely "on paper" or are there some peculiar factors operating which have allowed this country to skip certain steps and still have all parts of the system functional? It would be at any rate a good bet that within a few years either the advanced error items will have been dropped, or the intervening items made up. Although the planning system scale and the education system scale for Latin America are highly correlated (Kendall Tau = .68**) there are some obvious and marked anomalies. Why do Venezuela and Bolivia rank so high on the planning scale while ranking relatively low on the education scale? The converse question could be asked concerning Paraguay.

Another question raised by this scale relates to the three educational planning items, which fit the education scale as well. How is it possible for the same items to be aspects of two different, presumably unidimensional, universes? The answer would throw considerable light on the concept of unidimensionality, discussed previously, as it has been modified in light of the results and requirements of social object scaling.

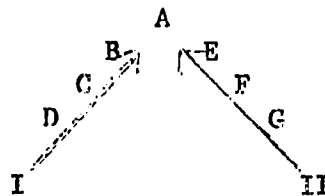
Summary

As originally devised for attitude study, the items used for scalogram analysis were responses to questions designed to get at relevant aspects of the attitude being studied. If the responses to a particular

question failed to scale, a judgment was first made as to whether the question was inadequate -- poorly phrased or misleading. If the question was determined to be adequate, then it was assumed that the unscalable responses were a function of additional variable. Unidimensionality meant that the responses to each question reflected only the single underlying variable. It was assumed to be possible to devise questions which would elicit responses reflecting only one variable.

The situation in social object scaling, however, is clearly different. The items of analysis are not answers to carefully phrased questions but are instead societal traits and institutions. It is a commonplace to say that social institutions are resultants of many interacting forces, of many underlying variables. Further, a given institution frequently performs diverse functions. Thus it is quite possible for educational planning institutions to reflect the institutional differentiation of both the educational system and the planning system; they are part of both systems, they reflect forces making for educational development and planning development, and they perform both educational and planning functions. This does not preclude the existence of separate underlying variables, structural educational differentiation and structural planning system differentiation; rather it indicates that the same response can be a reflection of both variables.

A diagram may illustrate this concept more effectively.



(A) is the set of educational planning institutions which are the

resultant of structural educational differentiation (I) and structural planning system differentiation (II). One can argue that (A) is a reflection of two variables (at least) and at the same time argue that if the institutions (A), (B), (C), and (D) together form a scale that this scale, or pattern of institutions or traits, measures a single variable, and likewise that if the institutions (A), (E), (F), and (G) together form a scale then that scale measures a different single variable. Thus, to conclude that a social object scale measures a single variable is to say something quite different than to conclude that an attitude scale is unidimensional. With the former it is not being concluded that each "response" is a function only of a single underlying variable, but rather that taken together the whole set of "responses" which make up a scale measures or reflects a single variable.

Yet, in final analysis it must be reemphasized that the application of scaling technique to social objects is very much in its infancy. The technical limitations of this technique are not yet fully known nor, therefore, are its range of practical applications. The explorations reported in this chapter at least suggest that when the right questions are asked, scales can provide useful insights into the development process.

CHAPTER 11

CONCLUSIONS AND IMPLICATIONS

The purposes of this study have been to add substantively and methodologically to the analysis of education and social development. No attempt has been made to present a definitive theory to assist in this task; however an exploratory theoretical framework is proposed in Part I to aid in focusing the subsequent chapters.

In Part II investigations are made of linkages between education and selected social processes and structural changes considered important (as judged by the theoretical and definitional statements of Chapter 1). The topics and problems chosen for analysis are more than illustrative, for they represent some of the most crucial considerations by developing societies. Hopefully, these chapters supply substantive insights into the developmental role of education.

A second general task performed by the preceding chapters is most in evidence in Part III. Here the inadequacy of current educational indicators is brought to light and the use of two somewhat more complicated measures of educational output is demonstrated. These measures, although leaving much to be desired in their ability to discern "qualitative" elements, at least make fuller use of data concerning the educational process. Further, although these measures demand much more educational information than typical educational indicators, it is hypothesized that the needed data over time for most highly developed nations and many less developed nations are available.


Refinement of Educational Measures

In order to build on the foundation laid by this study the most appropriate next steps are:

1. Additional applications of the two methods of measuring educational output discussed, using as many nations as have data.
2. Continued attempts at refinement of educational measures.
3. Identification of better measures for other social variables.
4. Utilization of improved educational and social measures in comparative historical studies of nations representing various types and levels of development.

In considering Step 1 above, an attempt must be made to evaluate further the utility of the pupil hour and pass year measures by judging the availability of needed data over a wide range of developed and under-developed nations. Data on more countries are also needed in order to determine the sensitivities of the measures to changes in a nation's educational policy and structural changes in the educational pyramid.

The possibilities for alterations and refinement in these educational measures (Step 2 above) are numerous. Different theoretical schemas would render different classifications of data (see footnote, page 27, Chapter 8). When examining the measures themselves it is obvious that the educational input measures for the pupil hour and pass year approaches are more sophisticated than the output measures. The input measure of the pass year approach could be made more descriptive by using better data on repeating students and by adding data on the number and training of administrators, and amount of labor reflected in the construction and operation of the facilities.



The output measures probably do not adequately reflect many learning experiences which have taken place in the school context. Nor can they identify directly the influences of the school as an institution on other social institutions. (These measures may, of course, demonstrate that many of the school's influences on the individual may be quite irrelevant in national development planning.)

Many of the insights needed to improve educational output measures may be forthcoming in the near future with the advent of cross national academic achievement testing. Achievement testing, which relates the knowledge, skills, and attitudes attained in particular subject areas to the school culture and to the larger society in which the school is enmeshed, can provide powerful empirical insights into the interaction of school and society and can contribute to social change theory. Some success has already been achieved in this area and it would seem safe to predict that the next several years will see cross national achievement testing a reality in all major academic areas.

Further refinement of the output measures would result if they could more accurately reflect the total educational enterprise of a nation including on-the-job training, adult education and the wide variety of specialized, short-term or part-time training programs. This added data would allow for more intensive country studies.

Yet even at their present level of crudity the techniques for measuring educational productivity and educational change illustrated in this study offer significant assistance in the long range intra sectoral study of education and the inter sectoral analysis of development. The pass year and pupil hour approaches, because of their ability to describe educational inputs and outputs more fully than currently available indicators, along with scalogram analysis, are of immediate practical value

396

to education decision making and planning at the national level. Moreover, these techniques can contribute to the theory of educational change and the methodology of comparative education. The needs in these latter two areas are great enough alone to justify continued efforts along the lines suggested in this chapter.

Scalogram analysis can be a useful tool in its own right in the study of development and also as a supplement to other techniques of measurement. In terms of the former, scalogram analysis can be particularly helpful in structural analysis by providing comparative insights into national institutional development. In a supplementary role, scalogram analysis can be of value in generating hypotheses and by reinforcing conclusions regarding educational development.

Several possibilities present themselves for extending the introductory analyses found in Chapter 10. For example, it would be useful to extend the educational scale backward and forward in time. Comparing the 1960 scale with scales of the same concept prior to and subsequent to 1960 would make it possible to examine the extent to which errors at one point in time are made up at a later date, thus adding to the predictive value of the scale pattern. There is also a need for elaboration of the educational scales by including more items, better item definition and through a more thorough search for data. Finally, effort should be directed toward the problem of the relation of scales to time. To argue that the relationship of scale patterns to time is not direct and invariable is not to argue that there is no relationship to time. An important step in learning more about this relationship would be to date the acquisition of scale items by the societies included in the scale, indicating when each society acquired each scale item.

397

Because the primary concern in this study relates to the ability of an educational system to participate in the process of development, attention must be given to the effects of both present and proposed educational programs. But how can the possible effect of educational programs and policies not now in existence be judged? One way is illustrated in the chapters in Part II which attempt to link theory and empirical findings related to particular social phenomena, i.e., social mobility, urbanization, population change and so forth. Education is then studied either as an initiator of social change or as an institution or process acted upon by other social forces. Comparative information on the social influences of a variety of "old" and existing educational programs can be of crucial value both in reaching conclusions about the present and in predicting the future.

If more precision is required in the study of education and social development, then devising better measures of social change (Step 3 above) becomes a necessary condition. The exploratory chapters in Part II are helpful in this regard; however, more extensive examination of the problem is necessary.

Improved Social Measures

As the discussions in Chapter 1 and Part II have suggested, a key underlying feature of social development is complexity, an ordered differentiation of parts or components in a social system. But complexity is a dynamic product of antecedent social change, which may be further analyzed in terms of two crucial aspects:

1. Alterations in values, attitudes and behavior of one or more categories of persons, either through the emergence of new roles and skills

398

or through transformation of existing roles. These alterations may be described as forms of specialization.

2. Alterations in the relations between roles, groups, and other subsystems of a society. These involve re-alignments in the distribution of power and authority, in direct and indirect control of influence over persons' opportunities. In practice, this aspect of complexity concerns increasing varieties (but not necessarily degrees or intensity) of interdependence among members of a given society.

It follows that development can be fruitfully studied and assessed through measures that record changes in both (a) the content of roles and (b) the interrelations of roles over given periods of time. However, several thousand years of human experience indicate that these phenomena are primarily linked with the emergence and growth of urban centers and with the inter-urban networks that provide both internal coordination and enduring relations with external systems.¹ But urban phenomena must be distinguished into two related (but not interchangeable) aspects. On the one hand, the demographic character of urban areas concerns the population density that is necessary, but not sufficient in itself, for distinctively urban structures. Population size and composition provide opportunities for urban roles and organizations. More significant, on the other hand, is the process of urbanization, that is, the cultural and social complexity which gives urban areas their special character as (a) recipients of past processes of social change and (b) arenas for subsequent change.

¹Viewed ideologically and from within the nation state these processes of change and growth multiply the possibilities for national integration. Although national integration does not necessarily flow from ecological growth of cities, urban life style does presuppose a high degree of structural and cultural, if not psychological, integration.

To measure the accomplishments of development programs, then, indicators of aspects of social development that satisfy several important criteria are required:

1. They should rest on some theory or model of social change. (Some explorations in this regard are presented in Chapter 1.)
2. They should reflect phenomena in the later phases of the change process (see Chapter 1) so as to allow the identification of different degrees of complexity.
3. They should cover a range of derivative effects of initial changes or programs, so as to maximize the possibility of identifying the growth of complexity.
4. They should deal not only with superficial external attributes, e.g., productivity, population density and composition, consumption patterns, but also with the more subtle components of complexity: the impact of values, attitudes, exertions, rationalizations, aspirations, frustrations, expectations, on a society or on significant sub-categories in a given society.

Based on these criteria and the partial theoretical framework previously sketched, the following is an illustrative (not an exhaustive) list of suggested measures of social change in developing nations. The indicators chosen have reliability and wide availability. Further, each measure attempts to get at different facets of the indicator -- the range hence is meaningful:

1. Saleable skills and their distribution: occupational breakdown in terms of amount of training, responsibility and independence of judgment, and access to status segments of the community:

1/00

Self-employed

- professional
- proprietors; merchants
- farm operators
- craftsmen

Dependent and Salaried

- professional and technical specialists
- managerial: upper and lower levels
- clerical-administrative
- sales personnel
- operatives (machines, repairs)
- personal services (domestics, etc.)
- laborers: farm, urban

Where such moderately detailed information is not available, a rough classification such as the following may be acceptable:

- professionals
- commercial and industrial managers and owners
- white collar (clerical-administrative)
- skilled (mechanics, craftsmen)
- farm labor and unskilled labor generally

2. Structure and operation of family units as (a) adaptations to change and (b) preparation for subsequent change:

Demographic Indicators

- percentage married, single, divorced
- age at marriage for male and female
- geographic sources of mates
- birth rates by income, occupation, education
(fertility ratios, net reproductive rates)
- income distribution by household type
- family crowding (persons/room)

Social Structure and Authority Indicators

- households with male heads
- households with wives working
- households containing wife's and husband's relatives
- responsibility for child-rearing
- decisions on consumption
- decisions on son's occupation

401-

3. Style of life: ways in which different social categories (e.g., occupational, educational, income categories) spend their income according to values and aspirations.

- family budgets (percentage on food, clothing, recreations, etc.)
- use of recreation and leisure (number of times in theaters, sports events, museums; hours listening to radio and TV; consumption of gas for autos, scooters; number of days spent on vacations)
- participation in voluntary associations, growth in number of such organizations, classified by type (ethnic, professional, recreational, artistic, etc.)
- recruitment sources for each life style (by income, occupation, geographic area, community size)

4. Political organizations and participation:

Organization

- number of public officials (by administrative level)
- percentage of distribution of skills and training among officials at each level (e.g., lawyers, engineers, economists)
- recruitment sources of public officials
- percentage of legislative enactments favoring or penalizing specific groups or roles (farmers, merchants)
- number of active political parties
- number of uncontested elections
- social characteristics of key decision-makers in local, regional, national matters

Political Participation

- percentage of adult population legally qualified to vote
- voter turnout (percentage of qualified voters) at local, national elections
- membership in specific political parties
- changing percentage support for existing parties
- percentage of electorate involved in rallies, financing support of candidates, and exposed to political appeals
- changes in social background of candidates (ethnic, religious, occupational, regional)

5. Patterns of social mobility:

- distribution of recruits to specific occupation categories, by father's occupation
- perceptions of opportunity for mobility, among children, young adults, and parents
- aspirations and plans for mobility among children, parents
- distribution of sacrifices, deferred gratifications, among those perceiving opportunities and aspiring to mobility.

402

6. Migration patterns:

- set migration to urban (by size category) and rural areas
- composition of migrant streams (age, sex, marital status, race, religion, occupation, education)

7. Urban community characteristics:

- acreage expansion (or square miles) of urban communities
- percentage of total population in urban areas (including percentage in cities of 100,000 and over)
- urban per capita expenditures for urban services (education, health, recreation, welfare, housing, etc.)
- changing proportions of public expenditures on each category of urban service
- rate of addition of new firms in urban areas, by type of firm (commercial, industrial, advertising, etc.)
- changing patterns of segregation by ethnic group, income, occupation in urban tracts or districts

As an example of the empirical application of this approach, an outline is provided in tabular form of the kinds of data and statistical measures required to determine (a) the existence of derivative social changes and (b) the relative contribution of educational output to specific social changes. The accompanying table, with hypothetical coefficients of correlation, may be used for a given nation, or some category of nations.

HYPOTHETICAL RELATION BETWEEN EDUCATIONAL OUTPUT
AND SELECTED SOCIAL INDICATORS

	Educational Indicator (X)			
	*Time 1	Time 2	Time 3	Time 4
A. Voting turnout	.30	.35	.38	.47
B. Percentage in middle class occupations	.50	.60	.70	.80
C. Percentage in urban areas	.60	.70	.72	.83
D. Percentage of working wives	.30	.40	.35	.37
E. Multiple of all 4 indicators	M ₁	M ₂	M ₃	M ₄

*Any given period of time sufficient for measurable change to occur.

403

The correlation coefficients in this table are simple correlations between education and selected social indicators. In addition, the multiple correlation of four sample indicators and education is presented. However, it is also desirable to determine the effect of education on each of the four indicators when the intercorrelations of these four are controlled (partial correlation measures), since some contamination can be reasonably expected of the simple correlations by the interactions between two or more of these four variables. For example, $r_{XA} = .30$, but $r_{XA \cdot BCD} = .15$, $r_{XA \cdot BC} = .16$, $r_{XA \cdot B} = .18$, $r_{XA \cdot CD} = .20$, $r_{XA \cdot C} = .22$, and $r_{XA \cdot BD} = .24$. These hypothetical partial correlations indicate, for that time period, that voting turnout is not reliably affected by education, when the effects of middle class occupations and percentage in urban areas are taken into account. It should be noted that several educational indicators and several indicators of the same specific social change may be employed. Such a decision simply increases the number of rows and columns and complicates statistical procedures.

Hopefully, typical patterns of effects on a limited number of social indicators can be derived for early, intermediate, and late phases of the development process. At this point, the nature of these patterns is a matter for conjecture, though multiple correlations can be expected to increase with time, even though correlations between education and specific social indicators do not exhibit progressive increase. Yet, if it is assumed that education plays a catalytic role in development, then the intercorrelations between and among social indicators would be expected to increase over time -- if the absence of barriers to interaction between social indicators can be further assumed. Indeed, one of the potentially valuable consequences of this kind of analysis for specific nations is the

404

discovery of the point or points in time (or phase of social development) at which specific educational programs reach their maximum impact. This will provide valuable clues to administrators about the need for additional changes in educational policy to continue or increase the production of desirable derivative effects (e.g., in occupational choice, middle class style of life, political involvement, etc.).

Summary

The foundation has been laid for the establishment of a framework for obtaining useful comparative historical measures of social development. Indeed part of a design for a data collecting mechanism has been suggested. To complete the design other social measures must be selected in terms of the criteria proposed. Further refinement of the mechanism itself can result from the addition of subcategories of the educational and social indicators. The final goal is the application of the instrument in such developed and less developed countries as hold promise of adequate data. In this manner it is possible to continue and extend the examination begun in this study in order to determine the leads and lags among: (a) the component elements of educational change, (b) various aspects of social change, and (c) the interaction between education and social development.

405